



A Sea Grammar,
WITH
THE PLAINE EXPOSITION
of SMITHS Accidence for young
Sea-men, enlarged.

Divided into fifteene Chapters: what they are you
 may partly conceiue by the Contents.

Written by Captaine IOHN SMITH, sometimes
 Gouvernour of VIRGINIA, and Admirall of
 NEW-ENGLAND.



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TO ALL
THE RIGHT
HONOURABLE, AND
most generous Lords in *England*,
especially those of his Maiesties Priuy
Councell, and Councell of Warre.

Great LORDS,



*V*lius *Cesar* wrote his
owne Commentaries,
holding it no lesse
honour to write, than
fight; much hath bin
writ concerning the
art of war by land, yet
nothing concerning
the same at Sea. Many others might better
than my selfe haue done this, but since I
found none endeuourd it, I haue aduentured,
encouraged by the good entertainment of

A z

my

The Epistle Dedicatory.

my late printed Accidence. This I suppose will be much bettered by men in these things better experienced, others ignorance may fault it: I haue beene a miserable Practitioner in this Schoole of Warre by Sea and Land more than thirty yeeres, howeuer chance or occasion haue kept me from your Lordships knowledge or imployment. Yet I humbly entreat your Lordships to accept and patronize this little Pamphlet, as the best testimony I can present your Honours, of my true duty to my King and Country. Thus humbly crauing your Honours pardons, and fauourable construction of my good intent, I remaine

Your Honours in all duty

to be commanded,

JOHN SMITH.



TO THE READER
AND ALL WORTHY AD-
uenturers by Sea, and well wishers to
NAVIGATION.

Honest Readers,



F my desire to doe good hath trans-
ported mee beyond my selfe, I
intreat you excuse me, and take
for requitall this rude bundle of
many ages obseruations; al-
though they be not so punctually compiled as I
could wish, and it may bee you expect; At this
present I cannot much amend them; if any will
bestow that paines, I shall thinke him my friend,
and honour his endeouours. In the interim ac-
cept them as they are, and ponder errours in the
balance of good will,

Your friend,

JOHN SMITH.

~~TO HIS WELL DESERVING~~
TO HIS WELL DESERVING
friend Captaine I O H N
S M I T H.

R Eader within this little worke thou hast
The view of things present, to come, and past,
Of consequence and benefit to such
As know but little, thinking they know much,
And in thy quiet chamber safely read,
Th'experience of the liuing and the dead,
Who with great paine and perill oft haue tride
When they on angry Neptunes backe did ride.
He hauing with his Trident strucke the maine,
To hoise them vp and throw them downe againe
Deare friend I'll cease and leaue it to thy Booke.
To praise thy labour. Reader ouer-look.

Edw. Ingham.

To the much deservuing Captaine,
Iohn Smith.

I Hate to flatter thee, but in my heart -
I honour thy faire worth and high desert,
And thus much I must say, thy merits claime
Much praise & honor, both from Truth & Fame.
What Iudge so e're thy Actions ouer-look,
Thou need'st not feare a triall by thy Booke.

Geor. Bucke



TO HIS VVORTHILY-
deseruing friend Captaine
I O H N S M I T H.

THe Lighter Hippias of Troy disclos'd,
Germans in India Cannowes now in trade,
The Barge by graue Amocles was compos'd,
The Argoeets first the Illyrians made,
The Galley Ison built that Græcian sparke,
The Cyprians first did crosse the Seas with Barke.

The Keele by the Phœnicians first was nam'd,
The Tyrrhens first made anchors, Plateans oares;
The Rhodians for the Brigandine are fam'd,
Cyrenians found the Cræc, and Creet adores
Dædal⁹ for Masts, and Saile-yards; Typhis wife
(With triple honour) did the sterne denise.

The Tackle famous Anacharsis wrought,
Noble Pyseus did the Stem first frame,
To light the Copians first the Rudder brought,
Young Icarus for Sailes acquir'd great fame,
Thou, with the best of these mas'st glory share,
That hast denis'd, compil'd a worke so rare.

For what long travels obseruations true
On Seas, (where waues doe seeme to wash the skies)
Haue made thee know, thou (willing) do'st unscrew
To those that want like knowledge, each man cries
Line worthy Smith; England for this endenour
Will (if not stupid) giue thee thanks for euer.



In laudem Nobilissimi viri
Johannis Smith.

Money, the worlds soule, that both formes and fames her,
Is her bad Genius to, it damnes, and shames her.
If merit and desert were truly weighed
In Justice Scales, not all by money sway'd;
Smith should not want reward, with many more,
Whom sad oblivion now doth over-flow.
For now no good things gotten without money,
Except tis got, as Beares from thornes licke honey,
With danger to themselves. For poore mens words
Are wind, and aire: Great men: are pickers, and swords.
Greatnesse more safe may act lust, theft, or treason,
Than poore Iohn Smith or I may steale two peason,
Or drinke a harmelesse cup, to chase away
Sad cares and griefes that hannt vs every day.
Who saw thy Virgin limbe by thee so truly,
Would sweare thou hadst bene one that sawest her newly,
One of her latest lovers. But to tell
The truth, I thinke they know her not so well.
And this Sea Grammar learn'd long since by thee,
Thou now hast form'd so artificiallie,
That many a beardslesse boy, and Artlesse soole,
Preferr'd before thee, may come to thy schoole.

John Hacthorpe.



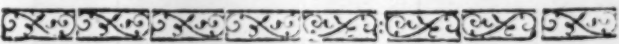
TO HIS FRIEND

Captaine Smith, on his

GRAMMAR.

Much traueled Captaine, I haue heard thy worth
 By Indians, in America set forth:
 Mee silence best seemes to keepe, and then
 Thy better praise be sung by better men,
 Who feele thy vertues worthinesse: Who can
 Deriue thy words, is more Grammarian,
 Than Camden, Clenard, Ramus, Lilly were;
 Here's language would haue non-plust Scaliger.
 These and thy trauels may in time be seene
 By those which stand at Helme, and prime ones beene.

Edw. Iorden.



In Authorem.

Each Science termes of Art hath wherewithall
 To expresse themselves, call'd Technologicall.
 Logicke doth teach what Pradicables bee,
 Genus and Species, * with the other three.
 Philosophie, purblind in the first Creation,
 Talks of first Matters forme, and void Priuation.
 Geographie teaches how for to define
 Tropicks, Meridians, and the Equators line.
 So words of Art belong to Nauigation
 And ships, which here from thee receiue translation;
 That now th'vntraueled land-man may with ease
 Here know the language both of ships and Seas.
 I haue no Art of words due praise to impart
 To see that thus expound'st these words of Art.

Technologicall, a
 Greeke word
 compounded of
 two Greeke
 words, *τεχνολο-*
για, signi-
 fies
 words of Art.
 { Genus.
 Species.
 Pr. 5. { Diffinitio
 Proprium.
 Accidens.

W.S.



In Authorem.

T *How which in Sea-learning would'st Clerk commence,
First learne to reade, and after reade to learne,
For words to sound, and not to know their sense,
Is for to saile a ship without a Sterne.*

*By this Sea Grammar thou mayst distinguish
And understand the Latine by the English.*

*Here mayst thou learne the names of all ships geere,
And with their names, their natures, and their use;
To hoise the Sailes, and at the Helme to steere;
To know each Shroud, each Rope, each Knot, each Noose,
And by their names to call them euery one,
'Tis such a Booke as may be call'd Such none.*

*And yet a Smith thereof the Authour is,
And from his Forge alone we haue the same,
Whe, for his skill in such a worke as this,
Doth farre excell all others of his name: (Smith,
He's neither Lock-Smith, Gold-Smith, nor Black-
But (to giue him his right name) he's Iack-Smith.*

S. S.



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THe Expositions of all the most difficult words seldome vsed but amongst sea men : where you finde the word in the Margent in that breake against it : you shall finde the exposition so plainly and briefly, that any willing capacity may easily vnderstand them.

A



A Sea Grammar.

CHAP. I.

Of Dockes, and their definitions.



Docke is a great pit or pond, A dry Docke.
or creeke by a harbour side,
made convenient to worke in,
with two great floud-gates
built so strong and close, that
the Docke may be dry till the
ship be built or repaired, and
then being opened, let in the
water to float and lanch her,
and this is called a dry
Docke. A wet Docke is any

A wet Docke.

place, where you may hale in a ship into the oze out of the
tides way, where shee may docke her selfe. A cradel is a
frame of timber, made along a ship, or the side of a gally
by her billidge for the more ease and safety in lanching, much
vsed in *Turkie, Spaine, and Italy*. And the stockes are
certaine framed posts, much of the same nature vpon the
shore to build a Pinnace, a Catch, a Frigor, or Boat, &c. To
those Dockes for building belongs their wood-yards, with
saw-pits, and all sorts of timber, but the masts and yards are

A Cradle.

The Stockes.

B

chained

A Crab.

chained together in some great water to keepe them from rotting, and in season; Also a crab is necessary, which is an engine of wood of three clawes, placed on the ground in the nature of a Capsterne, for the lanching of ships, or heaving them into the Docke.

CHAP. II.

How to build a ship with the definitions of all the principall names of euery part of her principall timbers, also how they are fixed one to another, and the reasons of their vse.

The Keele.

The Stem.

The Sterne.

The fashion peeces.

The Rungs.

The Limberholes

The Floore.

Rungheads.



He first and lowest timber in a ship is the keele, to which is fastened all the rest; this is a great tree or more, hewen to the proportion of her burden, laid by a right line in the bottome of the docke, or stockes. At the one end is skarfed into it, the Stem, which is a great timber wrought compassing, and all the butt-ends of the planks forwards are fixed to it. The Sterne post is another great timber, which is let into the keele at the other end somewhat sloping, & from it doth rise the two fashion peeces, like a paire of great hornes, to those are fastened all the planks that reach to the after end of the ship, but before you vse any planks, they lay the Rungs, called floore timbers, or ground timbers, thwart the keele; thorow those you cut your Limberholes to bring the water to the well for the pumpe, the vse of them is when the ship is built to draw in them a long haire rope, by pulling it from sterne to stem, to scowre them, and keepe them cleane from choaking.

Those ground timbers doe giue the floore of the ship, being straight, sawing at the ends they begin to compasse, and there they are called the Rungheads, and doth direct the

the Sweep or Mould of the Foot-hooks and Nauell timbers, for there doth begin the compasse and bearing of the ship, those are skarfed into the ground timbers, which is one peece of wood let into another, or so much wood cut away from the one as from the other, for when any of those timbers are not long enough of themselves, they are skarfed in this manner, to make two or three as one: those next the keele are called the ground Foot-hooks, the other the vpper Foot-hooks; but first lay your keele on ouer your floore timbers, which is another long tree like the keele, and this lying within as the other without, must be fast bound together with strong iron bolts thorow the timbers and all, and on those are all the vpper workes raised, when the Foot-hooks are skarfed, as is said, and well bolted, when they are planked vp to the Orlop they make the ships Howle, and those timbers in generall are called the ships ribs, because they represent the carkasse of anything hath ribs. The sleepers run before and after on each side the keele on, on the floore well bolted to the Foot-hooks, which being thus bound doe strengthen each other. The Spurkits are the spaces betwixt the timbers alongst the ship side in all parts, but them in Howle below the Sleepers, are broad boards, which they take vp to cleare the Spurkits, if any thing get betwixt the timbers.

Sweep.
Mould.
Skarfing.

Foot-hooks.
Keelesen.

Howle.
Ribs.
Sleepers.

Spurkits.

The Garbord is the first planke next the keele on the outside, the Garbord strake is the first seame next the keele, your rising timbers are the hooks, or ground timbers and foot-hooks placed on the keele, and as they rise by little and little, so doth the run of the ship from the floore, which is that part of the ship vnder water which comes narrower by degrees from the floore timbers along to the sterne post, called the ships way astward, for according to her run she will steare well or ill, by reason of the quicknesse or slownesse of the water comming to the rudder: now all those planks vnder water, as they rise and are ioyned one end to another, the fore end is called the Butt-end in all ships,

The Garbord.
Garbord strake.
Rising timbers.

The Run.

Plankes.
Butt-ends.

Treenails.
Trunnions.

Whooding.

The Tucke.

Transome.

Buttocks.

Rake.
The Hull.

Bluffe.
Bluff-headed.
Bilge.

but in great ships they are commonly most carefully bolted, for if one of those ends should spring, or giue way it would be a great troublesome danger to stop such a leake, the other parts of those planks are made fast with good Treenails and Trunnions of well seasoned timber, thorow the timbers or ribs, but those planks that are fastened into the ships stem are called whoodings.

The gathering of those workes vpon the ships quarter vnder water is called the Tucke, if it lie too low it makes her haue a fat quarter, and hinders the quicke passage of the water to the rudder; if too high she must be laid out in that part, else she will want bearing for her after workes. The Transome is a timber lies thwart the sterne, betwixt the two fashion peeces, and doth lay out the breadth of the ship at the buttocks, which is her breadth from the Tucke vponwards, and according there to her breadth or narrowness, we say she hath a narrow or broad buttocke, the fashion peeces, before spoke of, are the two outmost timbers, on either side the sterne, excepting the counters. The ships Rake is so much of her hull as hangs ouer both ends of the keele, so much as is forward is said, the rakes so much forward, and so in like manner astward: by the hull is meant, the full bulke or body of a ship without masts or any rigging from the stem to the sterne: The Rake forward is neere halfe the length of the keele, and for the Rake astward about the forepart of her Rake forward, but the fore Rake is that which giues the ship good way, and makes her keep a good wind, but if she haue not a full Bow, it will make her pitch her head much into the Sea; if but a small Rake forward, the sea will meet her so fast vpon the Bowes, she will make small way, and if her sterne be vp right as it were, she is called Bluffe, or Bluffe-headed. A ships Billage is the breadth of the floore when she doth lie aground, & Billage water is that which cannot come to the pumpe, we say also she is bilged, when she strikes on a rocke, an anchors flooke or any thing that breakes her planks or timbers, to spring a leake.

When

When you haue berthed or brought her vp to the planks, which are those thicke timbers which goeth fore and aft on each side, whereon doth lie the beames of the first Orlop, which is the first floore to support the planks doth couer the Howle, [those are great crosse timbers, that keepes the ship sides asunder, the maine beame is euer next the maine mast, where is the ships greatest breadth, the rest from this is called the first, second, third, fourth, &c. forward or astward beames. Great ships haue a tier of beames vnder the Orlop whereon lies no decke, and great posts and binders called Riders fix them to the keele in howle only to strengthen all. But the beames of the Orlop is to be bound at each end with sufficient Knees, which is a crooked peece of wood bowed like a knee, that bindes the beames and foot-hookes, being bolted together, some stand right vp and downe, some a long the ship, and are vsed about all the deckes, some sawed or hewed to that proportion, but them which grow naturally to that fashion are the best.

Lay the Orlop with good planke according to her proportion, so leuell as may be is the best in a man of Warre, because all the Ports may be of such equall height, so that euery peece may serue any Port, without making any beds or platformes to raise them, but first bring vp your worke as before to the second decke or Orlop, and by the way you may cut your number of port holes according to the greatnesse of your ship; by them fasten your Ringbolts for the tackles of your Ordnances, you vse Ringbolts also for bringing the planks and wails to the ship side, and Set bolts for forcing the workes and planks together, Clinch bolts are clinched with a riueting hammer for drawing out. But Rag bolts are so iaggared that they cannot be drawne out. Fore locke bolts hath an eye at the end, whereinto a fore locke of iron is driuen to keepe it from starting backe. Fend bolts are beat into the outside of a ship with the long head to saue her sides from galling against other ships. Drive bolts is a long peece of iron to drive out a treenaile, or any such thing, besides diuers others so vsfull that without them

Planks.

Beames.
Orlop.

Riders.

Knees.

Ports.

Beds.

Ringbolts.

Set bolts.

Clinch bolts.

Rag bolts.

Fore locke bolts.

Fend bolts.

Drive bolts.

She was builde of them and long iron spikes and nailes, nothing can be well done; yet I haue knowne a ship built, hath sailed to and againe ouer the maine Ocean, which had not so much as a naile of iron in her but onely one bolt in her keele.

Clamps.

Now your risings are about the first Orlop as the Clamps are vnder it, which is long thicke planks like them, tore and airt on both sides, vnder the ends of the Beames and timbers of the second Decke or Orlop, or the third Decke or Orlop, or the third Decke which is neuer called by the name of Orlop, and yet they are all but Decks; also the halfe Decke and quarter Decke, whereon the beames, and timbers beare are called risings. A Flush Decke is when from stem to sterne, it lies vpon a right line fore and aft which is the best for a man of Warre, both for the men to helpe and succour one another, as for the vsing of their armes, or remounting any dismounted peece, because all the Ports on that Decke are on equall height, which cannot be without beds and much trouble, where the Decke doth camber or lie compassing. To sinke a Decke is to lay it lower, to raise a Decke to put it higher, but haue a care you so cut your Port holes, one peece lie not right ouer another for the better bringing them to your marke.

Decke.

A halfe Decke.

A quarter Decke.

A Flush Decke.

A cambered
Decke.

To sinke a Decke.

To raise a Decke.

The halfe Decke is from the maine mast to the steareage, & the quarter Decke from that to the Masters Cabin called the round house, w^{ch} is the vtmost of all; but you must vnderstand all those workes are brought vp together, as neere equally as may bee from bend to bend, or waile to waile, which are the outmost timbers on the ship sides, and are the chiefe strength of her sides, to which the foot-hooks, beames, & knees, are bolted, and are called the first, second, and third Bend; but the chaine waile is a broad timber set out amongst them, a little about where the chaines and shrouds are fastened together to spread the shrouds the wider the better to succour the masts. Thus the sides and Deckes are wrought till you come at the Gunwaile, which is the vtmost waile goeth about the vtmost strake or or scame of the vtmost Decke about the ships waste, and the

Bend, or waile.

Chaine waile.

Gun waile.

the ships quarter is from the maine mast astward.

The ships quarters.
Culvertailed.
Carlings.

Culvertailed is letting one timber into another in such sort that they cannot slip out, as the Carling ends are fixed in the beames, and Carlings are certaine timbers lieth along the ship from beame to beame, on those the ledges doerest whereunto the planks of the Deckes are fastened. The Carling knees are also timbers comesthwart the ship from the sides of the Hatches way, betwixt the two masts, and beares vp the Decke on both sides, and on their ends lieth the commings of the hatches, which are those timbers and planks which beares them vp higher than the Deckes, to keepe the water from running downe at the hatches; also they fit Loopholes in them for the close fights, and they are likewise a great ease for men to stand vpright if the Deckes below. The Hatches way is when they are open where the goods are iowered that way right downe into the howle, and the hatches are like trap doores in the middelt of the Deckes, before the maine mast, by certaine rings, to take vp or lay downe at your pleasure.

Carling knees.

Commings.

Loopholes.

Hatches way.

A scuttle-hatch is a little hatch doth couer a little square hole we call the Scuttle, where but one man alone can goe downe into the ship, there are in diuers places of the ship whereby men passe from Decke to Decke, and there is also small Scuttles grated, to giue light to them betwixt Deckes, and for the smoke of Ordnances to passe away by. The Ramshead is a great blocke wherein is three shiuers into which are passed the halyards, and at the end of it in a hole is reued the ties, and this is onely belonging to the fore and maine halyards; to this belong the fore Knight, and the maine Knight, vpon the second Decke fast bolted to the Beames. They are two short thicke peeces of wood, commonly carued with the head of a man vpon them, in those are foure shiuers apeece, three for the halyards and one for the top rope to run in, and Kneuels are small pieces of wood nailed to the inside of the ship, to belay the shears and racks vnto.

A Scuttle.

Ramshead.

The fore Knight.
The main Knight.

Kneuels.

The Capstaine is a great peece of wood stands vpright vpon

Capstaine.

- Capitaine bars. vpon the Decke, abast the maine mast, the foot standing in a step vpon the lower decke, and is in the nature of a windis, to winde, or weigh vp the anchors, sailes, top masts, ordnances, or any thing it is framed in diuers squares, with holes thorow them, thorow which you put your Capitaine barres, for as many men as can stand at them to thrust it about, and is called manning the Capitaine. The maine body of it is called the Spindle. The Whelps are short peeces of wood made fast to it, to keepe the Cable from coming too high in the turning about; The Paul is a short piece of iron made fast to the Deck, resting vpon the whelps to keepe the Capitaine from recoiling which is dangerous, but in great ships they haue two, the other standing in the same manner betwixt the fore mast and the maine, to heaue vpon the leare rope, and is called the leare Capitaine, to straine any rope, or hold off by, when we way Anchor, to heaue a head, or vpon the violl, which is when an Anchor is in stiffe ground wee cannot weigh it, or the Sea goeth so high the maine Capitaine cannot purchase in the Cable, then we take a Hawser opening one end, and so puts into it Nippers some seuen or eight sadome distant from each other wherewith wee binde the Hawser to the Cable, and so brings it to the leare Capitaine to heaue vpon it, and this will purchase more than the maine Capitaine can. The violl is fastened together at both ends with an eye or two, with a wall knot and seased together. A windas is a square pece of timber, like a Role before the fore Castle in small ships, and forced about with handspikes for the same vse as is the Capitaine.
- The Pompe. What are the parts of a pompe you may see in euery place, the handle we call the brake, the pumpes can, is a great can we power water into pumps to make it pompe. The Brake. The can. The daile. The daile is a trough wherein the water doth runne ouer the Deckes; But in great ships they vse chained pumps which will goe with more ease, and deliuer more water. The Dutch men vse a Burre pompe by the ship side, wherein is onely a long staffe with a Burre at the end, like a Gunners sponge, to pompe vp the Billage water that by reason

son of the bredth of the ships floore cannot come to the well : In pumping they vse to take spels, that is, fresh men to releue them, and count how many strokes they pumpe each watch, whereby they know if the ship be stanch, or thire, or how her leakes increase. The Pumpe sucks, is when the water being out, it drawes vp nothing but froth and winde. They haue also a little Pumpe made of a Cane, a little peece of hollow wood or Latten like an Elder gun, to pumpe the Beere or Water out of the Caske, for at Sea wee vse no Taps, and then staue the Caske to make more roome, and packeth the Pipe-staues or boords vp as close as may be in other Caske till they vse them.

The Pumpe sucks.

A beare Pumpe.

The Skuppers are little holes close to all the Decks thorough the Ships sides, whereat the water doth runne out when you pumpe or wash the Decks; the Skupper-leathers are nailed ouer those holes vpon the lower Decke to keepe out the Sea from comming in, yet giue they way for it to runne out : Skupper nailes are little short ones with broad heads, made purposely to naile the Skupper-leathers, and the cotes of Masts and Pumps. The Waist is that part of the Ship betwixt the maine Mast and the fore-castle, and the Waist boords are set vp in the Ships waist, betwixt the Gun waile and the waist trees, but they are most vsed in Boats, set vp alongst their sides to keepe the Sea from breaking in.

The Skuppers.

Skupper leathers.

Skupper-nailes.

The Waist.

Waist boords.

Waist trees.

There are vsually three Ladders in a Ship; the entering Ladder is in the Waist, made formally of wood, and another out of the Gallery made of Ropes to goe into the boat by in foule weather, and the third at the Beak-head, made fast ouer the Boulspret to get vpon it, onely vsed in great Ships.

The entering Ladder.

Gallery Ladder.

Boulspret Ladder.

It were not amisse now to remember the Fore-castle, being as viesull a place as the rest, this is the forepart of the Ship aboue the Decks ouer the Bow; there is a broad Bow & a narrow Bow, so called according to the broadnes or the thinnesse: the Bow is the broadest part of the Ship before, compassing the Stem to the Loue, which reacheth so farre

The Fore-castle.

Bow.

Loue.

Cut a feather.

Hauſes.

Manger.

Prow.

The Beak-head.

Combe.

Bits.

Croſſpeece.

David.

as the Bulk-head of the Fore-castle extendeth. Againſt the Bow is the firſt breach of the Sea, if the Bow be too broad, ſhe will ſeldome carry a Bone in her mouth or cut a feather, that is, to make a ſome before her: where a well bowed Ship ſo ſwiftly preſſeth the water, as that it foameth, and in the darke night ſparkleth like fire. If the Bow bee too narrow, as before is ſaid, ſhe pitcheth her head into the Sea, ſo that the meane is the beſt if her after way be answerable. The Hauſes are thoſe great round holes before, vnder the Beak-head, where commonly is vſed the Cables when you come to an Anchor, the bold or high Hauſe is the beſt, for when they lielow in any great ſea, they will take in very much water, the which to keepe out, they build a circle of planke either abaft or before the maine Maſt called the Minger: and a Hauſe-plug at Sea, now the Fore-castle doth couer all thoſe being built vp like a halfe decke, to which is fixed the Beake-head, and the Prow is the Decke abaft the Fore-castle, whereon lyeth the Prow peece.

The Beak-head is without the ſhip before the fore Caſtle, ſupported by the maine knee, taſtened into the ſtem, all painted and carued as the ſterne, and of great uſe, as well for the grace and countenance of the ſhip, as a place for men to eaſe themſelues in. To it is taſtened the collar of the maine ſtay, and the fore racks there brought aboard; alſo the ſtanding for rigging and trimming the ſpretſaile geare, vnder the midelt of it is the Combe, which is a little peece of wood with two holes in it to bring the fore racks aboard. The Bits are two great peecees of timber, and the Croſſpeece goeth thorow them, they are ordinarily placed abaft the Minger in the ſhips loote, to belay the Cable thereto when you ride at Anchor: Their lower parts are taſtened to the Riders, but the middle part in great ſhips are bolted to two great beames croſſeto the Bowes, and yet in extraordinary ſtormes we are glad to make faſt the Cable to the maine Maſt for ſtrengthening of the Bits and ſafety of the Bowes, which haue in great ſtormes bene torne from the ſhips. The *David* is a ſhort peece of timber, at the end whereof

whereof in a notch they hang a blocke in a flap called the Fifth-block, by which they hale vp the flook of the Anchor to the Ships bow, it is put out betwixt the Car and the Loufe, and to be remoued when you please. The Car is also a short peece of timber aloft right ouer the Hawfe; in the end it hath two shiuers in a blocke, wherein is reeued a Rope, to which is fastned a great hooke of Iron, to trice vp the Anchor from the Hawfe to the top of the fore-castle.

Fifth-block.
Car.

A Bulks head is like a feeling or a wall of boords thwart the Ship, as the Gunroome, the great Cabin, the bread room, the quarter Decke, or any other such diuision: but them which doth make close the fore-castle, and the halfe Decke, the Mariners call the Cubbridge heads, wherein are placed murderers, and abaft Falcons, Falconets, or Rabinitis to cleare the Decks fore and aft so well as vpon the ships sides, to defend the ship and offend an enemy. Sockets are the holes wherein the pintels of the murderers or fowlers goe into. The hollow arching betwixt the lower part of the Gallery and the Transome, is called the lower Counter; the vpper Counter is from the Gallery to the arch of the round house, and the Brackets are little carued knees to support the Galleries.

A Bulkes head.

Cubbridge head.

Sockets.

Low Counter.
Vpper Counter.
Brackets.

The Stearage room, is before the great Cabin, where he that steareth the Ship doth alwaies stand, before him is a square box nailed together with wooden pinnes, called a Bittacle, because iron nailes would attract the Compasse; this is built so close, that the Lampe or Candle only sheweth light to the stearage, and in it alwaies stands the Compasse, which euery one knowes is a round box, and in the midst of the bottome a sharpe pin called a Center whereon the Fly doth play, which is a round peece of pace-board, with a small wyer vnder it touched with the Load-stone, in the midst of it is a little brasfe Cap that doth keepe it leuell vpon the Center. On the vpper part is painted 32. points of the Compasse couered with glasse to keepe it from dust, breaking, or the wind; this Box doth hang in two or three

The Stearage.
Great Cabin.

Bittacle.
The Compasse.

A darke Com-
passe.
A Compasse for
Variation.

The Triangles.

The Whip-staffe.

The Rowle.

The Tiller.
Rudder.

Pintels.
Gudgions or
Rudder-irons.
The Gun-roume.

Catholes.

Lockers.

The bread-
roume.
Cooke-roume.

brasse circles, so fixed they giue such way to the mouing of the Ship that still the Box will stand steady: there is also a darke Compasse, and a Compasse for the variation, yet they are but as the other, onely the darke Compasse hath the points blacke and white, and the other onely touched for the true North and South. Vpon the Bittacle is also the Triangles, which is a little round board full of holes vpon lines like the Compasse, vpon which by the remouing of a little sticke they keepe an account, how many glasses (which are but halfe houres) they steare vpon euery point. The Whip-staffe is that peece of wood like a strong staffe the Steersman or Helmsman hath alwaies in his hand, going thorow the Rowle, and then made fast to the Tiller with a Ring.

The Tiller is a strong peece of wood made fast to the Rudder, which is a great timber somewhat like a Planke, made according to the burthen of the ship, and hung at the sterne vpon hookes and hinges, they call Pintels and Gudgions, or Rudder-irons. The Tiller playeth in the Gun-roume ouer the Ordnances by the Whip-staffe; whereby the Rudder is turned to and fro as the Helmsman pleaseth, and the Cat holes are ouer the Ports, right with the Capstaine as they can, to heaue the Ship a sterne by a Cable or a Hauser called a sterne-fast. On each side the Stearage roume are diuers Cabins, as also in the great Cabin, the quarter Decke, and the round house, with many conuenient seates or Lockers to put any thing in, as in little Cupberris.

The Bread-roume is commonly vnder the Gun-roume, well dried or plated. The Cook-roume where they dresse their victuall may bee placed in diuers places of the Ship, as sometimes in the Hould, but that oft spoileth the victuall by reason of the heat, but commonly in Merchantmen it is in the Fore-castle, especially being contriued in Fornaces; besides in a chase their Sterne is that part of the ship they most vse in fight, but in a man of warre they fight most with their Prow, and it is very troublesome to the vse
of

of his Ordnance, and very dangerously lying over the Powder-
 roome, some doe place it over the Hatches way, but that
 as the Stewards roome are ever to be contrived according
 to the Ships imploiment, &c. Calking is beating Okum
 into every seame or betwixt planke and planke, and Okum
 is old Ropes torne in peeces like Towze Match, or Hurds
 of Flax, which being close beat into every seame with a
 calking Iron and a Mallet, which is a hammer of wood and
 an iron chissell, being well payed over with hot pitch,
 doth make her more thight than it is possible; by ioy-
 ning Planke to Planke. Graining is onely vnder water, a
 white mixt^{ure} of Tallow, Sope and Brimstone; or Train-
 oile, Resin, and Brimstone boyled together, is the best to
 preferue her calking and make her glib or slippery to passe
 the water; and when it is decayed by weeds, or Barnacles,
 which is a kinde of fish like a long red worme, will eat thro-
 row all the Plankes if she be not sheathed, which is as calsing
 the Hull vnder water with Tar, and Haire, close couered
 over with thin boords fast nailed to the Hull, which though
 the Worme pierce, shee cannot endure the Tar. Breaming
 her, is but walling or burning of all the filth with reeds or
 broome, either in a dry dock or vpon her Carcene; which is,
 to make her so light as you may bring her to lye on the one
 side so much as may be in the calmest water you can, but
 take heed you ouerset her not; and this is the best way to
 Breame Ships of great burthen, or those haue but 4. sharpe
 Flores for feare of bruising or ouersetting. Parfling is most
 vsed vpon the Decks and halfe Decks; which is, to take a
 list of Canuas so long as the seame is you would parfell,
 being first well calked, then powre hot pitch vpon it, and
 it will keepe out the water from passing the seames. There
 remains nothing now as I can remember to the building
 the Hull of a Ship, nor the definition of her most proper
 tearmes, but onely steling the Cabins and such other parts
 as you please, and to bind an end with all things fitting for
 the Sea, as you may reade in the Couenants betwixt the Car-
 penter and the Owner, which are thus.

Calking.
Okum.

Calking-Iron.
Paying.

Graining.

Barnacles,
or Wormes.

Breaming or
Breaming.
Carcene.

Parfling.

Notes for a Co-
venant betweene
the Carpenter
and the Owner.

If you would haue a Ship built of 400. Tuns, she requires a planke of 4. inches: if 300. Tuns, 3. inches: small Ships 2. inches, but none lesse. For clamps, middle bands and sleepers, they be all of six inch planke for binding within. The rest for the sparring vp of the workes of square three inch planke. Lay the beames of the Orlope, if she be 400. Tuns at ten foot deepe in howle, and all the beames to be bound with two knees at each end, and a stardard knee at euery beames end vpon the Orlope, all the Orlope to be laid with square three inch planke, and all the planks to be treenailed to the beames.

Six foot would be betweene the beames of the Deck and Orlope, and ten ports on each side vpon the lower Orlope, all the binding betweene them should bee with three inch or two inch planke, and the vpper Decke should bee laid with so many beames as are fitting with knees to bind them; laying that Decke with spruce Deale of thirty foot long, the sap cut off, and two inches thicke, for it is better than any other.

Then for the Captaines Cabben or great Cabben, the Stearage, the halfe Decke, the Round house, the Fore-castle, and to binde an end with the Capsterne and all things fitting for the Sea, the Smiths worke, the caruing, ioyning, and painting excepted, are the principall things I remember to be obserued, for a *Charter-party* betwixt the Merchant, the Master, and the Owner, you haue Presidents of all sorts in most Scriueners shops.

CHAP. III.

How to proportion the Masts and Yards for a Ship, by her Beame and Keele.



When a ship is built, she should be masted, wherein is a great deal of experience to be vied so well as art; for if you over-mast her, either in length or bignesse, she will lie too much downe by a wind, and labour too much a hull, and that

A Ship over-masted.

is called a Taunt-mast, but if either too small or too short, she is vnder masted or low masted, and cannot beare so great a saile as should giue her her true way. For a man of warre, a well ordered Taunt-mast is best, but for a long voyage, a short Mast will beare more Canuasse, and is lesse subiect to beare by the boord: Their Rules are diuers, because no Artist can build a Ship so truly to proportion, neither set her Masts, but by the triall of her condition, they may be impayred or amended: suppose a Ship of 300. Tunnes be 29. foot at the Beame, if her maine Mast be 24. inches diameter, the length of it must be 24. yards, for euery inch in thicknesse is allowed a yerd in length, and the fore Mast 22. inches in thicknesse, must bee 22. yards in length; your Bowle sprer both in length and thicknesse must bee equall to the fore Mast, the Mizen 17. yards in length, and 17. inches diameter.

Taunt-masted.
Vnder-masted.

An example.

But the Rule most vsed is to take the 4 parts of the bredth of the Ship, and multiply that by three, will giue you so many foot as your maine Mast should bee in length, the bignesse or thicknesse will beare it also, allowing an inch for a yerd; but if it be a made Mast, that is greater than one Tree, it must be more: for example, suppose the Ships bredth 30. foot, foure fifts of 30. foot are 24. foot, so you finde

The rule most vsed.

A made Mast, or an anne Mast.

finde the maine Mast must be 24. yards long, for every yard is 3. foot and 24. inches thorow, allowing an inch to every yard. The fore Mast is to be in length $\frac{1}{4}$ of the maine Mast, which will be 20. yards wanting one $\frac{1}{4}$ part of a yard, and 20. inches thorow. The Boulspret must cuer bee equall with the fore Mast. The misen Mast halte the length of the maine Mast, which will be 12. yards long, and 12. inches diameter. Now as you take the proportion of the Masts from the Beame or breadth of the Ship, so doe you the length of the yards from the Keele.

The Steps.
Partners.

Cotes.
Tarpawling.

Cheeks.

The Hounds.

The Cap.

Crosse-trees.
Tressell-trees.

Pillow.

An example of
the Yards by the
Keele.

These Masts have each their steps in the Ship, and their partners at every Decke where thorow they passe to the Keele, being strong timbers bolted to the Beams in circling the Masts, to keep them steady in their steps, fast wedged for rowlings; yet some ships will not saile so well as when it doth play a little, but that is very dangerous in foule weather. Their Cotes are peeces of tarred Canuas, or a Tarpawling put about them and the Rudder to keepe the water out. At the top of the fore Mast and maine Mast are spliced cheeks, or thicke clamps of wood, thorow which are in each two holes called the Hounds, wherein the Tyes doe runne to hoise the yards, but the top Mast hath but one hole or hound, and one tye. Every Mast also hath a Cap if a top; which is a peece of square timber with a round hole in it to receiue the top Masts or Flig stasse, to keepe them steady and strong, lest they be borne by the boord in a stiffe gale. The Crosse-trees are also at the head of the Masts, one let into another crosse, and strongly bolted with the Tressell trees, to keepe vp the top Masts which are fastened in them, and those are at the tops of each Mast; all the Masts stand vpright but the Boulspret which lyeth along ouer the Beak-head, and that timber it resteth on is called the Pillow.

Now for the yards, suppose the ship be 76. foot at the Keele, her maine yard must be 21. yards in length, and in thicknesse but 17. inches. The fore Yard 19. yards long, and 15. inches diameter or thick. The spret-saile Yard 16. yards

yards long, and but nine inches thicke, and your *Misen-yard* so long as the *Mast*, the top yards beares halfe proportion to the maine, and fore yard, and the top gallants, the halfe to them, but this rule is not absolute; for if your *Masts* be taunt, your yards must be the shorter; if a low *Mast*, the longer, but this is supposed the best. To haue the maine Yard $\frac{1}{2}$ parts of her *Keele* in length: the top Yard $\frac{3}{4}$ of the maine Yard, and the maine Yard for bignesse $\frac{1}{2}$ parts of an inch, for a yard in length. The length of the fore Yard $\frac{3}{4}$ of the maine Yard; the *Crosseiacke* Yard and *Spretfaile* Yard to be of a length; but you must allow the *Misen* Yard and *Spretfaile* Yard $\frac{1}{4}$ inch of thicknesse to a yard in length. But to giue a true Arithmetical and Geometrical proportion for the building of all sorts of Ships, were they all built after one mould, as also of their *Masts*, *Yards*, *Cables*, *Cor-dage*, and *Sailes*, were all the stuffe of like goodnesse, a methodicall rule as you see might bee proiccted: but their lengths, bredths, depths, rakes and burthens are so variable and different, that nothing but experience can possibly reach it.

CHAP. IIII.

The names of all the Masts, Tops, and Yards belonging to a Ship.



He *Boul-spreet*, the *Spretfaile* yard, the *Spretfaile* top-mast, the *Spretfaile* top faile yard, the fore *Mast*, the fore yard, the fore top-mast, the fore top-faile yard, the fore top gallant *Mast*, the fore top gallant faile yard, *Cores*, *Wouling*s, *Gromits*, and *Staples* for all yards.

The maine *Mast*, the maine *Yard*, the maine *Top*. The
D
maine

maine top Mast, the maine top-saile Yard. The top gallant Mast, the maine top gallant saile Yard. The Trucke is a square peece of wood at the top wherein you put the Flag-staffe. The Misen, the Misen Yard, the Misen top mast, the Misen top saile yard. The Crosse lacke. In great ships they haue two Misens, the latter is called the Bonaventure Misen. A Iury Mast, that is, when a Mast is borne by the boord, with Yards, Roofes, Trees, or what they can, spliced or fished together they make a Iury-mast, wounding or binding them with ropes fast triced together with handspikes, as they vse to would or binde any Mast or Yard.

CHAP. V.

How all the Tackling and Rigging of a Ship is made fast one to another, with their names, and the reasons of their vse.

Riggage or Cordage.

A Mast well rigged.

A Yard well rigged.

Over rigged.

All Masts haue staires except one.

A Coller.

A Lannier.



He rigging a Ship, is all the Ropes or Cordage belonging to the Masts and Yards; and it is proper to say, The Mast is well rigged, or the Yard is well rigged, that is, when all the Ropes are well lised to a true proportion of her burthen. We say also, when they are too many or too great, shee is ouer-rigged, and doth much wrong a Ship in her sailing; for a small waight aloft, is much more in that nature than a much greater below, and the more vpright any Ship goeth, the better she saileth.

All the Masts, Top-masts, and Flag-staues haue staires, excepting the Spret saile-top Mast, the maine Masts stay is made fast by a Lannier to a Coller, which is a great Rope that comes about the head and Boulspret, the other end to the head of the maine Mast. The maine top-Masts stay is fastened

fastened to the head of the fore Mast by a stop and a dead mans eye. The maine top-gallant Masts stay in like manner to the head of the fore top Mast. The fore Masts and stayes belonging to them in like manner are fastened to the Boutsprit, and Spritsaile top-Mast, and those stayes doe helpe to stay the Boutsprit. The Misen stayes doe come to the maine Mast, and the Misen top Mast stayes to the shrouds with Crowes-feet: the vse of those stayes are to keepe the Masts from falling astwards, or too much forwards. Those Lanniers are many small Ropes reeved into the dead mens eyes of all shrouds, either to slaken them or set them taught; also all the stayes haue their blocks, and dead mens eyes haue Lanniers. Dead mens eyes are blocks, some small, some great, with many holes but no shiuers, the Crowes-feet reeved thorow them are a many of small lines, sometimes 6. 8. or 10. but of small vse more than for fashion to make the Ship shew full of small Ropes. Blocks or Pullies are thick peeces of wood hauing shiuers in them, which is a little Wheele fixed in the midst with a Cocke or Pin, some are Braisse, but the most of Wood, whereon all the running Ropes doe runne, some are little, some great, with 3. 4. or 5. shiuers in them, and are called by the names of the Ropes whereto they serue. There are also double blocks, that where there is vse of much strength will purchase with much ease, but not so fast as the other, and when wee hale any Tackle or Halyard to which two blocks doe belong, when they meet, we call that blocke and blocke.

Dead mens eyes.

Crowes feet.

Blocks or Pullies.
Shiuers.

A Cocke.

Running ropes.

Double blocks.

Block and block.

All Masts haue
Shrouds, &c.

Chaines.

The Shrouds are great Ropes which goe vp either sides of all Masts. The Misen maine Mast and fore Mast shrouds haue at their lower ends dead mens eyes seased into them, and are set vp taught by Lanniers to the chaines; at the other end, ouer the heads of those Masts are pendants, for Tackels and Swiftners vnder them. The top-Masts shrouds in like manner are fastened with Lanniers and dead mens eyes to the Putrocks or plats of iron belonging to them, aloft ouer the head of the Mast as the other: and the Chaines are strong plates of iron fast bolted into the Ships side by the

Chaine.

To Ease.
Taught.

R. lines.
Puttocks.

Pendants.

Parrels.
Ribs.

Brest-ropes.
Standing ropes.

The Tackles are
of diuers sorts,
&c.

Chaine-wile. When the Shrouds are too stiffe, we say, ease them, when too slacke, we say, set Taught the Shrouds, but the Boulspree hath no Shrouds, and all those small ropes doe crosse the Shrouds like steps are called Ratlings. The Puttocks goe from the Shrouds of the fore Mast, maine Mast or Mizen, to goe off from the Shrouds into the Top, Cap, or Bowle, which is a round thing at the head of either Mast for men to stand in, for when the Shrouds come neere the top of the Mast, they fall in so much, that without the Puttocks you could not get into the Top, and in a manner they are a kinde of a Shroud. A Pendant is a short rope made fast at one end to the head of the Mast or the Yards arme, hauing at the other end a blocke with a shouer to reeue some running rope in, as the Pendants of the backe staies and Tackles hang a little downe on the inside of the Shrouds: all Yards-arnes haue them but the Mizen, into which the Braces are reeued, and also there are Pendants or Streamers hang from the yards arnes, made of Taffary, or coloured flanel cloth to beautifie the Ship onely: Parrels are little round Balls called Trucks, and little peeces of wood called ribs, and ropes which doe incircle the Masts, and so made fast to the Yards, that the Yards may slip vp and downe easily vpon the Masts, and with the helpe of the Brest-rope dorth keepe the Yard close to the Mast. The standing ropes are the shrouds and staies, because they are not remoued, except it be to be eased or set taughter.

The Tackles or ropes runne in three parts, hauing a Pendant with a blocke at the one end, and a blocke with a hooke at the other, to heaue any thing in or out of the ship; they are of diuers sorts, as the Botes tackles made fast the one to the fore shrouds, the other to the maine, to hoise the Bote in or out: also the tackles that keepe firme the Masts from straying. The Gunners tackles for haling in or out the Ordnances: but the winding rackle is the greatest, which is a great double blocke with three shouers to the end of a small Cable about the head of the Mast, and serueth as a Pendant.

Pendant. To which is made fast a Guy, which is a rope brought to it from the fore-mast, to keepe the Weight vpon it steady, or from Swinging to and againe: Into the blocke is reeued a hawser, which is also reeued thorow another double blocke, hauing a strop at the end of it, which put thorow the eye of the slings is locked into it with a fid, and so hoise the goods in or out by the helpe of the Snap-blocke.

A Guy.

Cat harpings are small ropes runne in little blockes from one side of the ship to the other, neere the vpper decke to keepe the shrouds tight for the more safety of the mast from rowling. The Halyards belong to all masts, for by them wee hoise the yards to their height, and the Ties are the ropes by which the yards doe hang, and doe carry vp the yards when wee straine the Halyards; the maine yard and fore yard ties are first reeued thorow the Rams head, then thorow the Hounds, with a turne in the eye of the slings which are made fast to the yard; the misen yard and top yard haue but single Ties, that is, one doth but run in one part, but the Spertsaile yard hath none, for it is made fast with a paire of slings to the boltspret. A Horse is a rope made fast to the fore mast shrouds, and the Spertsaile sheats, to keepe those sheats cleare of the anchor stookes.

Cat harpings.

Halyards.

The Ties.

A Horse.

To sling is to make fast any caske, yard, ordnances, or the like in a paire of Slings, and Slings are made of a rope spliced at either end into it selfe with one eye at either end, so long as to bee sufficient to receiue the caske, the middle part of the rope also they seaze together, and so maketh another eye to hitch the hooke of the tackle, another sort are made much longer for the hoising of ordnances, another is a chaine of iron to Sling or binde the yards fast aloft to the cross trees in a light, lest the ries should bee cut, and so the mast must fall. The Canhookes are two hookes fastened to the end of a rope with a noose, like this the Brewers vse to sling or carry their barrels on, and those serue also to take in or out hogheads, or any other commodities. A Parbunkell is two ropes that haue at each end a noose or lumpie that being

To Sling.
Slings.

Canhookes.

A Parbunkell.

crossed, you may see any vessell that hath but one head vpon them, bringing but the loopes ouer the vpper end of the caske, fix but the tackle to them, and then the vessell will stand strait in the midst to heaue out, or take in without spilling.

Puddings.

Puddings are ropes nailed round to the yards armes close to the end, a pretty distance one from another, to saue the Robbins from galling vpon the yards, or to serue the anchors ring to saue the clinch of the cable from galling. And the Robbins are little lines reeued into the eyler holes of the saile vnder the head ropes, to make fast the saile to the yard, for in stead of tying, seamen alwayes say, make fast. Head lines, are the ropes that make all the sailes fast to the yard.

Robbins.

Headlines.

Furling lines.

A smiting line.

Brales.

Furling lines are small lines made fast to the top saile, top gallant saile, and the misen yards armes. The misen hath but one called the smiting line, the other on each side one, and by these we fathrell or binde vp the sailes. The Brales are small ropes reeued thorow Blockes sealed on each side the ries, and come down before the saile, and at the very skirt are fastened to the Creengles, with them we furl or fathrell our sailes acrosse, and they belong onely to the two courses and the misen: to hale vp the Brales, or brale vp the saile, is all one; Creengles are little ropes spliced into the Bolt-ropes of all sailes belonging to the maine and fore mast, to which the bolings bridles are made fast, and to hold by when we shake off a Bonner.

Creengles.

Bolt ropes.

Bunt lines.

Clew Garnet.

Clew line.

Boltropes is that rope is sowed about euery saile, soft and gently twisted, for the better sowing and handling the sailes. Bunt lines is but a small rope made fast to the midst of the Boltrope to a crengle reeued thorow a small blocke which is sealed to the yard, to trice or draw vp the Bunt of the saile, when you fathrell or make it vp. The Clew garnet is a rope made fast to the clew of the saile, and from thence runnes in a blocke sealed to the middle of the yard, which in furling doth hale vp the clew of the saile close to the middle of the yard, and the clew line is the same to the
top

top sailes top gallant and spret sailes, as the Clew garnet is to the maine and foresailes. The Clew of a saile is the lowest corner next the Sheat and Tackes, and stretcheth somewhat goaring or sloping from the square of the saile, and according to the Goaring she is said to spread a great or a little clew. Tackes are great ropes which hauing a wall-knot at one end seased into the clew of the saile, and so reeued first thorow the chestres, and then commeth in at a hole in the shipsides, this doth carry forward the clew of the saile to make it stand close by a wind. The Sheats are bent to the clews of all sailes, in the low sailes they hale aft the clew of the sailes, but in top sailes they seruet to hale them home, that is, to bring the clew close to the yards arme. The Braces belong to all yards but the misten, euery yard hath two reeued at their ends thorow two pendants, and those are to square the yards, or trauasse them as you please. The Boling is made fast to the leech of the saile about the middest to make it stand the sharper or closer by a wind, it is fastened by two, three, or foure ropes like a crows foot to as many parts of the saile which is called the Boling bridles, onely the misten Boling is fastened to the lower end of the yard, this rope belongs to all sailes except the Spret-saile, and Spret-saile Top-saile, which not hauing any place to hale it forward by, they cannot vse those sailes by a wind: sharp the maine Boling is to hall it taught: hale vp the Boling is to pull it harder forward on: checke or ease the Boling is to let it be more slacke.

Lee fannings is a rope reeued into the creengles of the courses, when wee would hale in the bottome of the saile, to lash on a bonnet or rake in the saile; and Reeuing is but drawing a rope thorow a blocke or oylet to runne vp and down. Leech lines are small ropes made fast to the Leech of the top-sailes, for they belong to no other, and are reeued into a blocke at the yard close by the top-saile ties, to hale in the Leech of the saile when you take them in. The Leech of a saile is the outward side of a skirt of a saile, from the earing to the clew; and the Earing is that part of the bunt rope which

A Clew.

Goaring.
Tackes.

Sheats.

Braces.

Boling.

Boling bridles.

Sharp the Boling.
Checke the Boling.
Lee fanning.

Reeuing.

Leech lines.

Leech of a saile.

Earrings.

Bent.
Lifts.

Topping the
Lifts.
Legs.

Martnet.

Latchets.

Lashing.
The Loose hook.

Boufe.

A Bonnet.
A Drabler.
A Course.

A Knaue-line.

which at all the foure corners of the saile is left open as it were a ring. The two vpmost parts are put ouer the ends of the yards armes, and so made fast to the yards, and the lowermost are seased or Bent to the sheats, and tackes into the clew. The Lifts are two ropes which belong to all yards armes, to top the yards; that is, to make them hang higher or lower at your pleasure. But the top-saile Lifts doe serue for sheats to the top gallant yards, the haling them is called the Topping the Lifts, as top a Starboard, or top a port.

Legs are small ropes put thorow the bolt ropes of the maine and fore saile, neere to a foot in length, spliced each end into the other in the leech of the saile, hauing a little eye whereunto the martnets are fastened by two hitches, and the end seased into the standing parts of the martnets, which are also small lines like crow feet reeued thorow a block at the top mast head, and so comes downe by the mast to the decke; but the top-saile martnets are made fast to the head of the top gallant mast, and commeth but to the top, where it is haled and called the top martnets, they serue to bring that part of the leech next the yards arme vp close to the yard. Latchets are small lines sowed in the Bonnets and Drablers like loops to lash or make fast the Bonnet to the course, or the course to the Drabler, which we call lashing the Bonnet to the course, or the Drabler to the Bonnet. The Loose hooke is a tackle with two hookes, one to hitch into a chingle of the maine, or fore saile, in the bolt rope in the leech of the saile by the clew, and the other to strap spliced to the chestres to boufe or pull downe the saile to succour the tackes in a stiffe gale of wind, or take off or put on a Bonnet or a Drabler, which are two short sailes to take off or put to the fore course or the maine, which is the fore saile, or maine saile.

The Knaue-line is a rope hath one end fastened to the crosse trees, and so comes downe by the ties to the Rams head, to which is seased a small peece of wood some two foot long with a hole in the end, whereunto the line is reeued, and brought to the ships side, and haled taught to the

Railes

Railes to keepe the ties and Halyards from turning about one another when they are new. Knettels are two rope yarnes twisted together, and a knot at each end, whercunto to sease a blocke, a rope, or the like. Rope yarnes are the yarnes of any rope vntwisted, they serue to saue small ropes, or make Sinner, Mats, Plats, or Caburnes, and make vp the sailes at the yards armes.

Knettels.

Rope yarnes.

Sinner is a string made of rope yarne commonly of two, foure, six, eight or nine strings platted in three parts, which being beat flat they vse it to saue ropes or Mats. That which we call a Panch, are broad clouts, wouen of Thrums and Sinner together, to saue things from galling about the maine and fore yards at the ties, and also from the masts, and vpon the Boiespreet, Loufe, Beake-head or Gunwaile to saue the clewes of the sailes from galling or fretting. Caburne is a small line made of spun yarne to make a bend of two Cables, or to sease the Tackels, or the like. Seasing is to binde fast any ropes together, with some small rope yarne. Marline is any line, to a blocke, or any tackell, Pendant, Garnet, or the like. There is also a rope by which the Boat doth ride by the ships side, weh we cal a Seafen. To saue any rope with plats or Sinner, is but to lay Sinner, Spun yarne, Rope yarne, or a peece of Canuas vpon the rope, and then rowle it fast to keepe the rope from galling about the shrowds at the head of the masts, the Cable in the Hawse, the flooke of the Anchor, the Boat rope or any thing. Spun yarne is nothing but rope yarne made small at the ends, and so spun one to another so long as you will with a winch. Also Caskets are but small ropes of Sinner made fast to the gromits or rings vpon the yards, the longest are in the midst of the yards betwixt the ties, and are called the brest Caskets, hanging on each side the yard in small lengths, only to binde vp the saile when it is furled.

Sinner.

Mats or Panch.

Caburne.

Seasing.

Seafen.

Sarue or Siruis.

Spun yarne.

Caskets.

Marling is a small line of vntwisted hemp, very pliant and well tarred, to sease the ends of Ropes from raueling out, or the sides of the blockes at their arses, or if the saile rent out of the Boltrops, they will make it fast with marlin

Marling.

Mailing spike.

Splicing.

A round Splice.

A cut Splice.

A knot.

A Wall knot.

A Boling knot.

Sheepshanks
Knot.

till they haue leifure to mend it. The mailing spike, is but a small peece of iron to splice ropes together, or open the bolt rope when you sew the saile. Splicing is so to let one ropes end into another they shall be as firme as if they were but one rope, and this is called a round Splice; but the cut Splice is to let one into another with as much distance as you will, and yet bee strong, and vndoe when you will. Now to make an end of this discourse with a knot, you are to know, Sea-men vse three, the first is called the Wall knot, which is a round knob, so made with the strouds or layes of a rope, it cannot slip; the Sheates, Takes, and Stoppers vse this knot. The Boling knot is also so firmly made and fastened by the bridles into the creengles of the sailes, they will breake, or the saile split before it will slip. The last is the Sheepshanke, which is a knot they cast vpon a Runner or Tackle when it is too long to take in the goods, and by this knot they can shorten a rope without cutting it, as much as they list, and presently vndoe it againe, and yet neuer the worse.

CHAP. VI.

What doth belong to the Boats and Skiffe with the definition of all those thirteene Ropes which are onely properly called Ropes belonging to a ship and the Boat and their vse.

A long Boat.

A Shallop.
A Skiffe.



OF Boats there are diuers sorts, but those belonging to ships, are called either the long Boat or ships Boat, which should bee able to weigh her shear anchor, those will liue in any reasonable sea, especially the long Boat; great ships haue also other small Boats called Shallops and Skiffes, which are with more ease

ease and lesse trouble rowed to and againe vpon any small occasion. To a Boat belongs a mast and saile, a stay sheat & Halyard, Rudder & Rudder irons, as to a ship, also in any discouery they vse a Tarpawling, which is a good peece of Canuas washed ouer with Tar, to couer the Bailes or hoopes ouer the sterne of their Boat, where they lodge in an harbor which is that you call a Tilt couered with wad-mall in your Wherries; or else an Awning, which is but the boes saile, or some peece of an old saile brought ouer the yard and stay, and boured out with the boat hook e, so spread ouer their heads, which is also much vsed, as well a shore as in a ship, especially in hot countreys to keepe men from the extremity of heat or wet which is very oft infecti-ous. Thoughts are the sears whereon the Rowers sit; and Thowles small pins put into little holes in the Gunwaile or vpon the Boats side, against which they beare the oares when they row, they haue also a Daned, and also in long Boats a windleise to weigh the anchor by, which is with more ease than the ship can. The two arching rimbers against the Boat head are called Carlings. Man the Boat is to put a Gang of men, which is a company into her, they are commonly called the Coxswaine Gang who hath the charge of her. Free the Boat is to baile or cast out the wa-ter. Trim the Boat is to keepe her stright. Winde the Boat is to bring her head the other way. Hold water is to stay her. Forbeare is to hold still any oare you are comanded, or on the broad, or whole side. A fresh Spell is to relecue the Rowers with another Gang, giue the Boat more way for a dram of the bottell, who saies Amends, one and all, Vea, vea, vea, vea, vea, that is, they pull all strongly together.

Tarpawling.
Bailes.

Awning.

Thoughts.
Thowles.

A Gang.

Free or Baile.

Trim Boat.

Winde Boat.

Held water.

Forbeare.

A Spell.

Vea, vea, vea.

The Entering rope is tied by the ships side, to hold by as you goe vp the Entering ladder, cleats, or wailes.

The Entering
rope.

The Bucket rope that is tied to the Bucket by which you hale and draw water vp by the ships side.

Bucket rope.

The Bolt ropes are those wherein the sailes are sowed.

Bolt ropes.

The Port ropes hale vp the Ports of the Ordnances.

Port ropes.

The Teare rope is a peece of a hawser made fast to the

Teare rope.

maine yard, another to the fore yard close to the ties, reeved thorow a blocke which is seased close to the top, and to comes downe by the mast, and is reeved thorow another blocke at the bottome of the mast close by the decke; great ships haue on each side the ties one, but small ships none: the vse is to helpe to hoise vp the yard to succour the ties, which though they breake yet they would hold vp the mast.

Preuenter rope. The Preuenter rope is a little one seased crosse over the ties, that if one part of them should breake, yet the other should not runne thorow the Rams head to indanger the yard.

Top ropes. The Top ropes are those wherewith we set or strike the maine or fore Top masts, it is reeved thorow a great blocke seased vnder the Cap, reeved thorow the heele of the Top mast thwart ships, and then made fast to a ring with a clinch on the other side the Cap, the other part comes downe by the ties, reeved into the Knights, and so brought to the Capstaine when they set the Top masts.

Keele ropes. The Keele rope, you haue read in the building, is of haire in the Keele to scower the Limber holes.

Rudder rope. The Rudder rope is reeved thorow the stem post, and goeth thorow the head of the Rudder, and then both ends spliced together, serues to saue the Rudder if it should bee stricke off the irons.

Cat rope. The Cat rope is to hale vp the Cat.

Boy rope. The Boy rope is that which is tied to the boy by the one end, and the anchors flooke by the other.

Boat rope. The Boat rope is that which the ship doth tow her Boat by, at her sterne.

Ghest rope. The Ghest rope is added to the Boat rope when shee is towed at the ships sterne, to keepe her from shearing, that is, from swinging to and againe; for in a stiffe gale she will make such yawes, and haue such girds, it would indanger her to bee torne in peeces, but that they vse to swift her, that is, to incircle the Gunwaile with a good rope, and to that make fast the Ghest rope.

Swift.

CHAP. VII.

The names of all sorts of Anchors, Cables, and Sailes, and how they beare their proportions, with their vse. Also how the Ordnances should bee placed, and the goods stowed in a ship.



He proper rearmes belonging to Anchors are many: the least are called Kedgers, to vse in calme weather in a slow streame, or to kedg vp and downe a narrow Riuer, which is when they feare the winde or tide may driue them on shore; they row

A Kedger.

by her with an Anchor in a boat, and in the midst of the streame, or where they finde most fit if the Ship come too neere the shore, and so by a Hawser winde her head about, then waigh it againe till the like occasion, and this is kedging. There is also a streame Anchor not much bigger, to stemme an easie stream or tide. Then there is the first, second, and third Anchor, yet all such as a Ship in faire weather may ride by, and are called Bow Anchors. The greatest is the sheat Anchor, and neuer vsed but in great necessity. They are commonly made according to the burthen of the Ship by proportion, for that the sheat Anchor of a small ship will not serue for a Kedger to a great ship. Also it beareth a proportion in it selfe, as the one flooke, which is that doth sticke in the ground, is but the third part of the shanke in length; at the head of the Shanke there is a hole called an Eye, and in it a Ring, wherein is the Nut to which there is fast fixed a Stocke of wood crossing the Flookes, and the length is taken from the length of the Shanke. These

Streame Anchor.
The first.
Second.
Third Anchor.
Sheat Anchor.

An Anchors
Shanke.
Flook.
Shoulder.
Beame or Nut.
Eye.
Ring.
Stocke.

differ not in shape but in waight, from two hundred, to three or foure thousand waight. Grapells, or Graplings, are the least of all, and haue foure flookes but no stock; for a boat to ride by, or to throw into a ship in a fight, to pull downe the gratings or hold fast.

The Cables also carry a proportion to the Anchors, but if it be not three stroud, it is accounted but a Hawser, yet a great ships Hawser may be a Cable to the ilear Anchor for a small ship: and there is the first, second, and third Cable, besides the Shear Anchor Cable. If the Cable bee well made, we say it is well laid. To keckell or tarue the Cable, as is said, is but to bind some old clouts to keepe it from galling in the Hawse or Ring. Splice a Cable, is to fasten two ends together, that it may be double in length, to make the Ship ride with more ease, and is called a shot of Cable. Quoile a Cable, is to lay it vp in a round Ring, or fake one about another. Pay more Cable, is when you carry an Anchor out in the boat to turne ouer. Pay cheap, is when you ouer set it, or turnes it ouer boord faster. Veere more Cable, is when you ride at Anchor. And end for end is when the Cable runneth cleere out of the Hawse, or any Rope out of his shiuer. A Bight is to hold by any part of a coile, that is, the vpmost fake. A Bitter is but the turne of a Cable about the Bits, and veare it out by little and little. And the Bitters end is that part of the Cable doth stay within boord. Gert, is when the Cable is so taught that vp-on the turning of a tide, a Ship cannot goe ouer it.

To bend the Cable to the Anchor, is to make it fast to the Ring; vnbend the Cable, is but to take it away, which we vsually doe when we are at Sea, and to tie two ropes or Cables together is called bending. Hitch, is to catch hold of any thing with a rope to hold it fast, or with a hooke, as hitch the fish-hooke to the Anchors flooke, or the Tackles into the Garnets of the Slings. Fenders are peeces of old Hawsers called Iunkes hung ouer the ship sides to keepe them from brusing. In boats they vse poles or boat-hooks to fend off the boat from brusing. A Brest-fast is a rope

A Cable, the
first, second, and
third.

Shear Anchor
Cable.
Keckell.

Splice.

A shot of Cable.
Quoile.
A Fake.
Pay.
Pay cheap.

End for end.

A Bight.
A Bitter.

A Bitters end.
Gert.

To bend.
Vnbend.

Bending.
Hitch.

Fenders.
Iunkes.

Brest-fast.

rope which is fastened to some part of the Ship forward on, to hold her head to a wharfe or any thing, and a Sterne-fast is the same in the Sterne. The vse for the Hawser is to warp the Ship by, which is laying out an Anchor, and winde her vp to it by a Capsterne. Rousing is but pulling the slack-nesse of any Cables with mens hands into the Ship. The Shank-painter is a short chaine fastend vnder the fore masts shrouds with a bolt to the ships sides, and at the other end a rope to make fast the Anchor to the Bow. To stop is when you come to an Anchor, and veares out your Cable, but by degrees till the Ship ride well, then they say stop the Ship. To those Cables and Anchors belongs short peeces of wood called Boyes, or close hooped barrells like Tankards as is said, but much shorter, to shew you the Anchor and helpe to waigh it, there is another sort of Cans called Can Boyes much greater, moored vpon shoules to giue Mariners warning of the dangers.

The maine saile and the fore saile is called the fore course, and the maine course or a paire of courses. Bonits and Drablers are commonly one third part a peece to the saile they belong vnto in depth, but their proportion is vncertaine; for some will make the maine saile so deepe, that with a shallow boner they will cloath all the Mast without a Drabler, but wickhout boners we call them but courses; we say, lath on the boner to the course, because it is made fast with Latchers into the eylothe holes of the saile, as the Drabler is to it, and vsed as the wind permits. There is also your maine top-saile, and fore top-saile, with their top-gallant sailes, and in a faire gaile your studding sailes, which are bolts of Canuasse, or any cloth that will hold wind, wee extend alongh the side of the maine saile, and boomes it out with a boome or long pole, which we vse also sometimes to the clew of the maine saile, fore saile, and spret saile, when you goe before the wind or quartering, etc. now. Your Mizzen, and Mizzen top saile, your Spret and Spret top saile, as the rest, take all their names of their yards. A Drife saile is onely vsed vnder water, veared out right a head by sheats,

Sternefast.

Rousing.

Shank-painter.

Stop.

Boyes.

Can Boyes.

Sailes.

Maine Saile.

Fore Saile.

Maine course.

Fore course.

Bonits.

Drablers.

Maine top Saile.

Fore top Saile.

Top gallant

Sailes.

Studding Sailes.

Mizzen.

Mizzen top Saile.

Spret saile.

Spret saile top.

Saile.

Drife Saile.

Netting Saile.
Nettings.

Waist-trees.
Route-trees.

Stantions.
Gratings.

Head Saile.

After Sailes.

Leech.

The Clew.

Goring.

A Monke seame.
A Round seame.

to keepe the Ships head right vpon the Sea in a storme, or when a ship driues too fast in a current. A Netting saile is onely a saile laid ouer the Netting, which is small ropes from the top of the fore castle to the Poope, stretched vpon the ledges from the Waist-trees to the Rouse-trees, which are onely small Timbers to beare vp the Gratings from the halfe Decke to the fore-castle, supported by Stantions that rest vpon the halfe Decke; and this Netting or Grating, which is but the like made of wood, you may set vp or take downe when you please, and is called the close fights fore and aft. Now the vse of those sailes is thus, all head Sailes which are those belonging to the fore Mast and Boltsprer, doe keepe the Ship from the wind or to fall off. All after sailes, that is, all the sailes belonging to the maine Mast and Mizzen keepe her to wind ward, therefore few ships will steare vpon quarter winds with one saile, but must haue one after saile, and one head saile. The sailes are cut in proportion as the Masts and Yards are in bredth and length, but the Sprer-saile is $\frac{1}{4}$ parts the depth of the fore saile, and the Mizzen by the Leech twise so deepe as the Mast is long from the Decke to the Hounds. The Leech of a saile is the outward side or skirt of the saile from the earing to the clew, the middle betwixt which wee account the Leech. The Clew is the lower corner of a Saile, to which you make fast your Sheats and Tacks, or that which comes goring out from the square of the saile, for a square saile hath no Clew, but the maine saile must bee cut goring, because the Tacks will come closer aboard, and so cause the saile to hold more wind; now when the Saile is large and hath a good Clew, we say she spreads a large Clew, or spreads much Canuas. In making those sailes they vse two sorts of seames downe the Sailes, which doth sow the bredth of the Canuas together, the one we call a Munke seame, which is flat, the other a round seame, which is so called because it is round.

The Ship being thus provided, there wants yet her Ordnances, which should be in greatnesse according to her building

building in strength and burthen, but the greatest commonly lieth lowest, which we call the lower tier, if she bee furnished fore and aft. Likewise the second Tier, and the third, which are the smallest. The fore-Castle and the halfe Decke being also furnished, wee account halfe a Tier.

A Tier.
Thud.
Second.
Halfe a Tier.

Stowage or to stow, is to put the goods in Howle in order. The most ponderous next the Ballast, which is next the Keelson to keepe her stiffe in the Sea. Ballast is either Grauell, Stones, or Lead, but that which is driest, heaviest, and lies closest is best. To finde a leake, they trench the Ballast, that is, to diuide it. The Ballast wil sometimes shoor, that is, run from one side to another, and so will Corne and Silt, if you make not Pouches or Bulk-heads, which when the Ship doth heeld is very dangerous to ouerset or turne the Keele vpwards. For Caske that is so stowed, tier aboue tier with Ballast, and canting Coines, which are little short peeces of wood or Billets cut with a sharpe ridge or edge to lye betwixt the Caske, and standing Coines are Billets or Pipe-staues, to make them they cannot giue way nor stirre. The ship will beare much, that is, carry much Ordnance or goods, or beare much saile, and when you let any thing downe into the Howle, lowering it by degrees, they say, Amaine; and being downe, Strike.

Stowage.
To Stow.
Ballast.

Trench the Ballast.
Shout.

Canting Coines.

Standing Coines.
To beare,

F

C H A P.

C H A P. VIII.

The charge and duty of the Captaine of a ship, and every Office and Officer in a man of Warre.

The Captaines charge.



The Captaines charge is to command all, and tell the Master to what Port hee will goe, or to what Height; In a fight he is to give direction for the managing thereof, and the Master is to see the cunning of the ship, and trimming of the sailes.

The Master and his Mates.

The Master and his Mates are to direct the course, command all the Sailers, for steering, trimming, and sailing the ship; his Mates are only his seconds, allowed sometimes for the two mid ships men, that ought to take charge of the first prize.

The Pilot.

The Pilot when they make land doth take the charge of the ship till he bring her to harbour.

The Chirurgeon and his Mate.

The Chirurgeon is to be exempted from all duty, but to attend the sicke, and cure the wounded: and good care would be had he haue a certificate from Barber Chirurgions Hall of his sufficiency, and also that his chest be well furnished both for Physicke and Chirurgery, and so neare as may be proper for that clime you goe for, which neglect hath bene the losse of many a mans life.

The Cape-merchant or Purser.

The Cape-merchant or Purser hath the charge of all the Carragafoune or merchandize, and doth keepe an account of all that is received, or deliuered, but a man of Warre hath onely a Purser.

The Gunner with his Mate, and quarter Gunners.

The Master Gunner hath the charge of the ordnance, and shot, powder, match, ladles, sponges, wormes, carrriages,

crages, armes and fire-workes ; and the rest of the Gunners, or quarter Gunners to receiue their charge from him according to directions, and to giue an account of their store.

The Carpenter and his Mate, is to haue the nailes, clinches, rooue and clinch nailes, spikes, plates, rudder irons, pumpe nailes, skupper nailes and leather, sawes, files, hatchets and such like, and euer ready for calking, breaming, stopping leakes, fishing, or splicing the masts or yards as occasion requireth, and to giue an account of his store.

The Carpenter
and his Mate.

The Boatswaine is to haue the charge of all the cordage, tackling, sailes, fids and marling spikes, needles, twine, saile-cloth, and rigging the ship, his Mate the command of the long boar, for the setting forth of anchors, weighing or fetching home an anchor, warping, towing, or moring, and to giue an account of his store.

The Boatswaine
and his Mate.

The Trumpeter is alwayes to attend the Capitaines command, and to sound either at his going a shore, or coming aboard, at the entertainment of strangers, also when you hale a ship, when you charge, boord, or enter ; and the poope is his place to stand or sit vpon, if there bee a noise, they are to attend him, if there be not, euery one hee doth teach to beare a parr, the Capitaine is to incourage him, by increasing his shares, or pay, and giue the master Trumpeter a reward.

The Trumpeter.

The Marshall is to punish offenders, and to see iustice executed according to directions, as ducking at the yards arme, haling vnder the keele, bound to the capsterne, or maine mast with a basket of shor about his necke, setting in the bilbowes, and to pay the Cobtie or the Morionne ; but the boyes the Boatswaine is to see euery Munday at the chest, to say their compasse, and receiue their punishment for all their weekes offences, which done, they are to haue a quarter can of beere, and a basket of bread, but if the Boatswaine eat or drinke before hee catch them, they are free.

The Marshall.

The Corporall is to see the setting and relecuing the watch, and see all the souldiers and sailers keepe their armes

The Corporall

The Steward &
his Mate.

cleane, neat, and yare and teach them their vse.

The Steward is to deliuer out the victuals according to the Captaines directions, and melle them soure, fine, or six, as there is occasion.

The quarter
Masters.

The quarter Masters haue the charge of the howle, for stowing, romaging, and trimming the ship in the hold, and of their squadrons for the watch, and for fishing to haue a Sayne, a fisgig, a harpin yron, and fish hookes, for *Porgies*, *Bonetos*, *Dolphins*, or *Dorados*, and rayling lines for *Mackrels*.

The Cooper and
his Mate.

The Cooper is to looke to the caske, hoopcs and twigs, to staue or repaire the buckets, baricos, cans, steepe tubs, runlers, hogsheds, pipes, buts, &c. for wine, beare, sider, beuerage, fresh water, or any liquor.

The Coxswaine
and his Mate.

The Coxswaine is to haue a choise Gang to attend the skiffe to goe to and againe as occasion commandeth.

The Cooke and
his Mate.

The Cooke is to dresse and deliuer out the victuall, hee hath his store of quarter cans, small cans, platters, spoones, lanthornes, &c. and is to giue his account of the remainder.

The Swabber.

The Swabber is to wash and keepe cleane the ship and maps.

The Liar.

The Liar is to hold his place but for a weeke, and hee that is first taken with a lie, euerie Munday is so proclaimed at the maine mast by a generall cry, a Liar, a Liar, a Liar, hee is vnder the Swabber, and onely to keepe cleane the beake head, and chaines.

The Sailers.

The Sailers are the ancient men for hoisting the sailes, getting the tacks aboard, haling the bowlings, and steering the ship.

The Younkers.

The Younkers are the young men called fore-mast men, to take in the top-sailes, or top and yard, for furling the sailes, or slinging the yards, bouising or trising, and take their turnes at helme.

The Lieutenant
his place.

The Lieutenant is to associate the Captaine, and in his absence to execute his place, hee is to see the Marshall and Corporall doe their duties, and assist them in instructing the

the souldiers, and in a fight the fore-castle is his place to make good, as the Captaine doth the halfe decke, and the quarter Masters, or Masters Mace the mid ships, and in a States man of Warre, he is allowed as necessary as a Lieutenant on shore.

CHAP. IX.

Proper Sea tearmes for diuiding the company at Sea, and steering, sayling, or moring a Ship in faire weather, or in a storme.



It is to bee supposed by this the Ship is victualled and manned, the voiage determined, the steepe Tubs in the chains to shift their Beete, Porke, or Fish in salt water, till the salt be out though not the saltneesse, and all things else ready to set saile; but before wee goe any further,

for the better vnderstanding therest, a few words for steering and cunning the Ship would not bee amisse. Then know, Star-boord is the right hand, Lar-boord the left; Starboord the Helme, is to put the Helme a Starboord, then the ship will goe to the Larboord. Right your Helme, that is, to keepe it in the mid ships, or right vp. Port, that is, to put the Helme to Larboord, and the Ship will goe to the Starboord, for the Ship will euer goe contrary to the Helme. Now by a quarter wind, they will say aloofe, or keepe your loose, keepe her to it, haue a care, of your Lee-larch. Touch the wind, and wane no more, is no more but to bid him at the Helme to keepe her so neere the wind as may be; no neere, ease the Helme, or beare vp, is to let her fall to Lee-ward. Steady, that is, to keepe

Steepe Tubs.

Starboord.
Larboord.
Cunning.
Steering.
Mid-ships.
Port.

A loofe.
Keep your loose.
War no more.
No neare.
Ease.
Steady.

Yare.

her right vpon that point you steare by; be yare at the Helme, or a fresh man to the Helme. But he that keepes the Ship most from yawing doth commonly vse the left morion with the Helme, and those steare the best.

Geare.

Pedy.

A Pike.

Tally.

The Master and company being aboard, he commands them to get the sailes to the yards, and about your geare or worke on all hands, stretch forward your maine Halliards, hoise your Sailes halfe mast high. Pedy, or make ready to set saile, crosse your yards, bring your Cable to the Capstern, Boatswaine fetch an Anchor aboard, breake ground or weigh Anchor. Heaue a head, men into the Tops, men vpon the yards; come, is the Anchor a pike, that is, to heaue the Hawse of the ship right ouer the Anchor, what is the Anchor away? Yea, yea. Let fall your fore-saile. Tally, that is, hale off the Sheats; who is at the Helme there, coile your Cables in small fakes, hale the Car, a Bitter, belay, loose fast your Anchor with your shank-painter, stow the Boat, set the land, how it beares by the Compasse that we may the better know thereby to keep our account and direct our course, let fall your maine saile, euery man say his priuate prayer for a boone voyage, out with your sprit saile, on with your bonits & Drablers, steare steady & keep your course, so, you go wel.

How they diuide
the company at
sea, and set, and
rule the watch.

When this is done, the Captaine or Master commands the Boatswaine to call vp the company; the Master being chiefe of the Starboord watch doth call one, and his right hand Mate on the Larboord doth call another, and so forward till they be diuided in two parts, then each man is to chuse his Mate, Consort, or Comrade, and then deuide them into squadrons according to your number and burthen of your ship as you see occasion; these are to take their turnes at the Helme, trim sailes, pumpe, and doe all duties each halfe, or each squadron for eight Glasse or foure houres which is a watch, but care would bee had that there be not two Comrades vpon one watch because they may haue the more roome in their Cabbins to rest. And as the Captaine and masters Mates, Gunners, Carpenters, Quartermasters, Trumpeters, &c. are to be abast the Mast, so the Boat-

Boatswaine, and all the Yonkers or common Sailers vnder his command is to be before the Mast. The next is, to melle them foure to a melle, and then giue euery melle a quarter Can of beere and a basket of bread to stay their stomacks till the Kettle be boiled, that they may first goe to prayer, then to supper, and at six a clocke sing a Psalm, say a Prayer, and the Master with his side begins the watch, then all the rest may doe what they will till midnight; and then his Mate with his Larboord men with a Psalm and a Prayer releues them till foure in the morning, and so from eight to twelue each other, except some flaw of winde come, some storme or gust, or some accident that requires the helpe of all hands, which commonly after such good cheere in most voyages doth happen.

For now the wind veeres, that is, it doth shift from point to point, get your Starboord tacks aboard, and tally or hale off your Lee-Sheats. The Ship will not wayer, settle your maine Topsaile, veere a fadome of your sheat. The wind comes faire againe and a fresh gale, hale vp the slatch of the Lee-bolting. By Slatch is meant the middle part of any rope hangs ouer boord. Veere more sheat, or a flowne sheat, that is, when they are not haled home to the blocke. But when we say, let fly the sheats, then they let go amaine, which commonly is in some gust, lest they spend their topsailes, or if her quicke sidelic in the water, ouerset the ship. A flowne sheat is when shee goes before the wind, or betwix a paire of sheats, or all sailes drawing. But the wind shrinkes, that is, when you must take in the Spretsaile, and get the tacks aboard, hale close the maine Bolting, that is, when your Tacks are close aboard. If you would saile againt the wind or keepe your owne, that is, not to fall to lee-ward or goe backe againe, by haling off close your Bolings, you set your sailes so sharp as you can to lie close by a wind, thwarting it a league or two, or more or lesse, as you see cause, first on the one boord then on the other; this we call boarding or beari'g ir vp vpon a tacke in the winds eye, or bolting to and againe, but the longer your

The wind veeres.
Tally.

Flowne.

Fly.

A paire of courses.

How to handle a
ship in a storme.

Try.

Hull.

Under the Sea.
Weather coile.

Rowling.
Labour.

Spoone.

Trough.

Founder.

To spend a mast.
Spring a mast.

your boords are, the more you worke or gather into the wind. If a sudden flaw of wind should surprise you, when you would lower a yard so fast as you can, they call *A maine*; but a crosse saile cannot come neerer the wind than six points, but a Caruell whose sailes stand like a paire of Tailers sheeres, will goe much neerer.

It over-casts we shall haue wind, fowle weather, settrell your top sailes, take in the spret-saile, in with your top-sailes, lower the fore-saile, tallow vnder the parrels, brade vp close all the sailes, lash sure the ordnance, strike your top-masts to the cap, make it sure with your sheeps feet. A storme, let vs lie at Trie with our maine course, that is, to hale the tacke aboard, the sheat close aft, the boling set vp, and the helme tied close aboard. When that will not serue then Try themizen, if that split, or the storme grow so great she cannot beare it; then hull, which is to beare no saile, but to strike a hull is when they would lie obscurely in the Sea, or stay for some comfort, lash sure the helme a lee, and so a good ship will lie at ease vnder the Sea as wee terme it. If shee will weather coile, and lay her head the other way without loosing a saile, that must bee done by bearing vp the Helme, and then she will driue nothing so farre to Leeward. They call it hulling also in a calme swelling Sea, which is commonly before a storme, when they strike their sailes lest she should bear them in peeces against the mast by Rowling. We say a ship doth Labour much when she doth rowle much any way; but if she will neither Try nor Hull, Then Spoone, that is, put her right before the wind, this way although shee will rowle more than the other, yet if she be weake it will not straine her any thing so much in the Trough of the Sea, which is the distance betwixt two waues or Billowes. If none of this will doe well, then she is in danger to founder, if not sinke. Foundering is when she will neither veere nor steare, the Sea will so ouer rake her, except you free out the water, she will lie like a log, and so consequently sinke. To spend a mast or yard, is when they are broke by fowle weather, and to spring a mast is when it is cracked in any place.

In

In this extremity he that doth can the ship cannot haue too much iudgement, nor experience to try her drift, or how she capes, which are two rearmes also vsed in the trials of the running or setting of currants. A yoke is when the Sea is so rough as that men cannot gouern the Helme with their hands, & then they sease a block to the Helme on each side at the end, & reeuing two fals thorow them like Gunners Tackles brings them to the ships side, and so some being at the one side of the Tackle, some at the other, they steare her with much more ease than they can with a single rope with a double Turne about the Helme.

A Yoke.

When the storme is past, though the wind may alter three or foure points of the compasse, or more, yet the Sea for a good time will goe the same way; then if your course be right against it, you shall meet it right a head, so we call it a head Sea. Sometimes when there is but little wind, there will come a contrary Sea, and presently the winde after it, wherby we may iudge that from whence it came was much winde, for commonly before any great storme the Sea will come that way. Now if the ship may runne on shore in ose or mud she may escape, or Billage on a rocke, or Ancors flooke, repaire her leake, but if she split or sinke, shee is awracke. But seeing the storme decreaseth, let vs trie if she will endure the Hullocke of a Saile, which sometimes is a peece of the mizen saile or some other little saile, part opned to keepe her head to the sea, but if yet shee would weather coile, wee will loose a Hullocke of her fore-saile, and put the Helme a weather, and it will bring her head where her sterne is; courage my hearts.

A head Sea.

Hullocke.

It cleares vp, set your fore-saile; Now it is faire weather, out with all your sailes, goe lardge or laske, that is, when we haue a fresh gale, or faire wind, and all sailes drawing. But for more haste vnparrell the mizen yard and lanch it, and the saile ouer her Lee quarter, and fit Gines at the further end to keepe the yard steady, and with a Boome boome it out; this we call a Goose-wing. Who is at Helme there? Sirra you must be amongst the Points; Well Master the

Lardge.

Laske.

Goosewing.

the Channell is broad enough; Yet you cannot steare betwix a paire of shears; Those are words of mockery betwix the Cunner and the Steersman. But to proceed,

Get your Larboord Tackes aboard, hale off your starboord shears, keepe your course vpon the point you are directed, Port, he will lay her by the lee; the staies, or backe staies, that is, when all the sailes flutter in the winde, and are not kept full, that is full of wind, they fall vpon the masts and throwds, so that the ship goes a drift vpon her broad side, fill the sailes, keepe full, full and by. Make ready to Tack' e about, is but for every man to stand to handle the sailes and ropes they must hale, Tacke about is to beare vp the helme, and that brings her to stay all her sailes lying flat against the throwds, then as she turnes wee say shee is payed, then let rise your Lee tackes and hale off your shears, and trim all your sailes as they were before, which is cast of that Boling which was the weather boling, and hale vp taught the other. So all your Shears, Brases, and Tackes are trimmed by a winde as before. To belay, is to make fast the ropes in their proper places. Round in, is when the wind larges, let rise the maine tacke and fore tacke, and hale att the fore sheat to the cars head, and the maine sheat to the cubbridge head, this is Rounding in, or rounding aft the saile; the shears being there they hale them downe to keepe them firme from flying vp with a Pasarado, which is any rope wherewith wee hale downe the shears, blockes of the maine or fore saile, when they are haled att the clew of the maine saile to the Cubbridge head of the maine mast, and the clew of the fore saile to the Car head; Doe this when the ships goes large.

Round in.

Rounding aft.
Pasarado.

Obserue.

Dead water.

The Wake.

Obserue the height, that is, at twelue a clocke to take the height of the Sunne, or in the night the North star, or in the forenoone and afternoone, if you misse these by finding the Azimuth and Almicanter. Dead water is the Eddie water followes the sterne of the ship, nor passing away so quickly as that slides by her sides. The wake of a ship is the smooth water a sterne shewing the way shee hath gone

gone in the sea, by this we iudge what way she doth make, for if the wake be right a lterne, we know she makes good her way forwards; but if to Lee-ward a point or two, wee then thinketo the Lee-ward of her course, but shee is a nimble ship that in turning or tacking about will not fall to thee Lee-ward of her wake when shee hath weathered it.

Disimbogue is to passe some narrow strait or current into the maine Ocean, out of some great Gulfe or Bay. A Drift is any thing floating in the sea that is of wood. Rockweed doth grow by the shore, and is a signe of land, yet it is oft found farre in the Sea. Lay the ship by the Lee to trie the Dipfie line, which is a small line some hundred and fifty fadome long, with a long plummet at the end, made hollow, wherein is puttallow, that will bring vp any grauell; wch is first marked at twenty fadome, and after increased by tens to the end; and those distinguished by so many small knots vpon each little string that is fixed at the marke thorow the strouds or middest of the line, shewing it is so many times ten fadome deepe, where the plummet doth rest from drawing the line out of your hand; this is onely vsed in deepe water when we thinke we approach the shore, for in the maine sea at 300. fadomes we finde no bottome. Bring the ship to rights, that is, againe vnder saile as she was, some vse a Log line, and a minute glasse to know what way shee makes, but that is so vncertaine, it is not worth the labour to trie it.

Disimbogue.

A Drift.

Rockweed.

Dipfie line.

Plummet.

Log line.

One to the top to looke out for land, the man cries out Land to; which is iust so farre as a kenning, or a man may discover, descrie, or see the land. And to lay a land is to saile from it iust so farre as you can see it. A good Land fall is when we fall iust with our reckoning, if otherwise a bad Land fall; but howeuer how it beares, set it by the compasse, and bend your Cables to the Anchors. A Head land, or a Point of land doth lie further out at sea than the rest. A Land marke, is any Moueraine, Rocke, Church, Windmill or the like, that the Pilot can know by comparing one by another how they beare by the compasse. A Reach

Land to.

Kenning.

To lay a land.

Good land fall.

Bad land fall.

A head land.

A Point.

Land marke.

To raise a land.

To make land.

A Reach.

Sounding line.

The Lead.

Fowle water.

Beare in.

Beare off.

Beare vp.
Hold off.

Surges.

Neale to.

A Roade.
Offing.

is the distance of two points so farre as you can see them in a right line, as White Hall and London Bride, or White Hall and the end of Lambeth towards Chelsey. Fetch the Sounding line, this is bigger than the Dipsieline, and is marked at two fadome next the lead with a peece of blacke leather, at three fadome the like, but slit; at 5. fadome with a peece of white cloth, at 7. fadome with a peece of red in a peece of white leather, at 15. with a white cloth, &c. The sounding lead is six or seuen pound weight, and neere a foot long, he that doth heave this lead stands by the horse, or in the chaines, and doth sing fadome by the marke 5. c. and a shafment lesse, 4. o. this is to finde where the ship may saile by the depth of the water. Fowle water is when she comes into shallow water where shee raises the sand or ose with her way yet not touch the ground, but shee cannot feele her helme so well as in deepe water.

When a ship sailes with a large wind towards the land, or a faire wind into a harbour, we say she beares in with the land or harbour. And when she would not come neere the land, but goeth more Roome-way than her course, wee say she beares off; but a ship boord, beare off is vsed to euery thing you would thrust from you. Beare vp is to bring the ship to goe large or before the wind. To Hold off is when we heave the Cable at the Capsterne, if it be great and stiffe, or slimie with ose, it surges or slips backe vnlesse they keep it close to the whelps, and then they either hold it fast with nippers, or brings it to the Ieare Capsterne, and this is called Holding off. As you approach the shore, shorten your sailes, when you are in harbour take in your sailes, and come to an anchor, wherein much iudgement is required.

To know well the soundings, if it be Nealed to, that is, deepe water close aboard the shore, or shallow, or if the Lee vnder the weather shore, or the lee shore be sandy, clay, ose, or fowle and rockie ground, but the Lee shore all men would shun that can auoid it. Or a Roade which is an open place neere the shore. Or the Offing which is the open Sea from the shore, or the middest of any great streame is called

led the Offing. Land locke, is when the land is round about you. Landlocked.

Now the ship is said to Ride, so long as the Anchors doe hold and comes not home. To Ride a great roade is when the winde hath much power. They will strike their top masts, and the yards alongst ships, and the deeper the water is, it requires more Cable; when wee haue rid in any distresse wee say wee haue rid hawse full, because the water broke into the hawses. To ride betwixt wind and tide, is when the wind & tide are contrary & of equall power, which will make her rowle extremely, yet not straine much the cable. To Ride thwart is to ride with her side to the tide, and then she neuer straines it. To ride a pike is to pike your yards when you ride amongst many ships. To ride acrosse is to hoise the maine and fore yards to the hounds, and topped alike. When the water is gone and the ships lies dry, we say she is Sewed; if her head but lie dry, she is Sewed a head; but if she cannot all lie dry, she cannot Sew there. Water borne is when there is no more water than will iust beare her from the ground. The water line is to that Bend or place she should swim in when she is loaded.

To Ride.
Ride a great Roade.
Ride a stresse.
Ride betwixt.
Wind and tide.
Ride thwart tide.
Ride a pike.
Ride crosse.

Sewed.
Sew.
Water borne.
Water line.

Lastly, to More a ship is to lay out her anchors as is most fit for her to ride by, and the wayes are diuers; as first, to More a faire Berth from any annoiance. To More a crosse is to lay one anchor to one side of the streame, and the other to the other right against one another, and so they beare equally ebbe and flood. To More alongst is to lay an anchor amidst the streame ahead, and another asterne, when you feare driuing a shore. Water shot is to more quattering betwixt both nether crosse, nor alongst the tide. In an open rode they will more that way they thinke the wind will come the most to hurt them. To more a Prouiso, is to haue one anchor in the riuer, and a hawser a shore, which is mored with her head a shore; otherwise two cables is the least, and foure cables the best to more by.

To More.
More crosse.
More alongst.
Water shot.
More Prouiso.

C H A P. X.

Proper tearmes for the Winds, Ebbes, Floods, and Eddies, with their definitions, and an estimate of the depth of the Sea, by the height of the Hills and the largeness of the Earth.

A Calme.

A Breze.



When there is not a breath of wind stirring, it is a calme or a starke calme. A Breze is a wind blowes out of the Sea, and commonly in faire weather beginneth about nine in the morning, and lasteth till neere night; so likewise all the night it is from the shore which is called a Turnado, or a Sea-turne, but this is but vpon such coasts where it bloweth thus most certainly, except it be a storme, or very fowle weather, as in *Barbaria*, *Egypt*, and the most of the Levant. We haue such Brezes in most hot countreys in Summer, but they are very vncertaine. A fresh Gale is that doth presently blow after a calme, when the wind beginneth to quicken or blow. A faire Looe Gale is the best to saile in, because the Sea goeth not high, and we beare our all our sailes. A stiffe Gale is so much wind as our top-sailes can endure to beare. An Eddie wind is checked by the saile, a mountaine, turning, or any such thing that makes it retorne backe againe. It ouer blowes when we can beare no top-sailes. A flaw of wind is a Gust which is very violent vpon a sudden, but quickly endeth. A Spout in the West Indies commonly falleth in those Gusts, which is, as it were, a small riuer falling entirely from the clouds, like out of our water Spouts, which make the Sea where it falleth rebound

in

A fresh gale.

A Looe gale.

Eddie wind.

It ouer blowes.

A Gust.

A Spout.

in flashes exceeding high. Whirle winds runneth round, and bloweth diuers wayes at once. A storme is knowne to every one not to bee much lesse than a tempest, that will blow downe houses, and trees vp by the roots. A Mounfoune is a constant wind in the East Indies, that bloweth alwayes three moneths together one way, and the next three moneths the contrary way. A Hericano is so violent in the West Indies, it will continue three, foure, or fve weekes, but they haue it not past once in fve, six, or seuen yeeres; but then it is with such extremity that the Sea flies like raine, and the waues so high, they ouer flow the low ground by the Sea, in so much, that ships haue been driuen ouer tops of high trees there growing, many leagues into the land, and there left, as was Captaine *Francis Nelson* an Englishman, and an excellent Sea man for one.

We say a calme sea, or Becalmed, when it is so smooth

the ship moues very little, and the men leap ouer boord to swim. A Rough Sea is when the waues grow high. An ouergrowne Sea when the surges and billowes goe highest. The Rut of the sea where it doth dash against any thing. And the Roaring of the Sea is most commonly obserued a shore, a little before a storme or after a storme.

Flood is when the water beginneth to rise, which is young flood as we call it, then quarter flood, halfe flood, full Sea, still water, or high water. So when it Ebbes, quarter ebbe, halfe ebbe, three quarter ebbe, low water, or dead low water every one doth know; and also that as at a spring tide the Sea or water is at the highest, so at a Neape tide it is at the lowest. This word Tide, is common both to Flood and Ebe; for you say as well tide of ebbe, as tide of flood, or a windward Tide when the Tide runnes against the streame, as a Lee-ward Tide, that is, when the wind and the Tide goeth both one way, which makes the water as smooth as the other rough. To Tide ouer to a place, is to goe ouer with the Tide of ebbe or flood, and stop the contrary by anchoring till the next Tide, thus you may worke against the wind if it ouer blow not. A Tide gate is where the

A whirle wind.

A Storme.

A Tempest.

A Mounfoune.

A Hericano.

Becalmed.

A Rough Sea.

An ouergrowne Sea.

Surges.

The Rut of the Sea.

The Roaring of the Sea.

Floods & ebbes.

A Tide of ebbe.

A Tide of flood.

A windward Tide.

A Lee-ward tide.

To Tide ouer.

A Tide gate.

Tide and halfe
Tide.

Eddie Tide.

The height of
mountaines per-
pendicular.

the tide runneth strongest. It flowes Tide and halfe Tide, that is, it will be halfe flood by the shore, before it begin to flow in the channell; for although the Tide of flood run aloft, yet the Tide of ebbe runnes close by the ground. An Eddie tide is where the water doth runne backe contrary to the tide, that is, when some headland or great point in a Riuer hindereth the free passage of the streame, that causeth the water on the other side the point to turne round by the shore as in a circle, till it fall into the tide againe.

As touching the reasons of ebbes and floods, and to know how far it is to the bottome of the deepest place of the Sea, I will not take vpon me to discourse of; as knowing the same to be the secrets of God vnreuealed to man: only I will set downe a Philosophicall speculation of diuers mens opinions touching the depth of the Sea; which I hope will not be thought much impertinent to the subiect of this booke by the iudicious Reader.

Fabianus in *Plinie*, and *Cleomides* conceiued the depth of the Sea to be fiftene furlongs, that is, a mile and ½ parts, *Plutarch* compared it equall to the highest mountaines, *Scallinger* and others conceited the hills farre surpassed the deepnesse of the Sea, and that in few places it is more than a hundred paces in depth, it may bee hee meant in some narrow Seas, but in the maine Ocean experience hath taught vs it is much more than twice so much, for I haue sounded 300. fadome, yet found no ground. *Eratosthenes* in *Theon* that great Mathematicitian writeth the highest mountain perpendicular is but ten furlongs, that is, one mile and a quarter. Also *Dicaarcus* affirmeth this to be the height of the hill *Pelium* in *Thessalia*, but *Xenagoras* in *Plutarch* obserued the height of *Olimpus* in the same region to be twenty paces more, which is 1270. paces, but surely all those meane onely those mountaines in or about *Greece* where they liued and were best acquainted; but how these may compare with the Alps in *Asia*, *Atlas* in *Africa*, *Caucasus* in *India*, the *Andes* in *Peru*, and diuers others hath not yet beene examined.

But

But whatsoeuer the hills may be about the superficies of the earth, many hold opinion the Sea is much deeper, who suppose that the earth at the first framing was in the superficies regular and sphericall, as the holy Scriptures directs vs to beleue; because the water couered and compassed all the face of the earth, also that the face of the earth was equall to that of the Sea. *Damasceen* noteth, that the vneuenesse and irregularity which now is seene in the earths superficies, was caused by taking some parts out of the vpper face of the earth in sundry places to make it more hollow, and lay them in other places to make it more conuex, or by raising vp some part and deprelling others to make roome and receit for the Sea, that mutation being wrought by the power of the word of the Lord, *Let the waters be gathered into one place that the dry land may appeare.* As for *Aquinas*, *Dionysius*, *Catharianus*, and some Diuines that conceited there was no mutation, but a violent accumulation of the waters, or heaping them vp on high is vnreasonable; because it is against nature, that water being a flexible and a ponderous body, so to consist and stay it selfe, and not fall to the lower parts about it; where in nature there is nothing to hinder it, or, if it be restrained supernaturally by the hand and bridle of Almighty God, lest it should ouerwhelme and drowne all the land, it must follow, that God euen in the very institution of nature imposed a perpetuall violence vpon nature. And this with all, that at the Deluge there was no necessity to breake vp the springs of the deepe and to open the cataracts of Heauen, and powre downe water continually so many daies and nights together, seeing the only with-drawing of that hand, or letting goe of that bridle which restrained the water would presently haue ouerwhelmed all.

But both by Scriptures, the experience of Navigators, and reason in making estimation of the depth of the Sea, reckon not onely the height of the hills about the common superficies of the earth, but the height of all the dry land about the superficies of the Sea, because the whole masse

The height of the hills compared with the superficies of the earth and depth of the Sea.

How all the hills and dry land about the superficies of the Sea hath made roome for the Sea, therefore they are in equall of height & depth.

of earth that now appeareth about the waters, being taken as it were out of the places which the waters now possesse, must be equall to the place out of which it was taken; so consequently it seemeth, that the height or eleuation of the one should answer the descending or depth of the other; and therefore in estimating the depth of the Sea, wee consider not onely the erection of the hills about the ordinary land, but the aduantage of the dry land about the Sea; which latter, I meane the height of the ordinary maine land, excluding the hills, which properly answer the extraordinary deepes and whirle-pooles in the Sea. The rest is held more in large Continents about the Sea, than that of the hills is about the land.

That there is
small difference
betwixt the
springs first
rising out of the
earth, and their
falling into the
Sea.

For that the plain face of the dry land is not leuel, or equally distant from the Center, but hath a great descent towards the Sea, and a rising towards the mid-land parts, although it appeare not plainly to the eye, yet to reason it is most manifest; because we find that part of the earth the Sea couereth descendeth lower and lower towards the Sea. For the Sea, which touching the vpper face of it, is knowne by nature to be leuell and euently distant from the center, is obserued to wax deeper & deeper the further one sailerh from the shore towards the maine Ocean: even so in that part which is vntouered, the streamings of Riuer on all sides from the mid-land parts towards the Sea, sliding from the higher to the lower declareth so much, whose courses are some 1000. or 2000. miles, in which declination, *Pliny* in his deriuation of water requireth one cubit of declining in 240. foot of proceeding. But *Columella*, *Viturnius*, *Paladius*, and others, in their conduction of waters require somewhat lesse; namely, that in the proceeding of 200. foot forward, there shou'd bee allowed one foot of descending downeward, which yet in the course of 1000. miles, as *Danubius*, *Volgha*, or *Indus*, &c. haue so much or more, which will make five miles of descent in perpendicular account, and in the course of 2000. or more, as *Nilus*, *Niger*, and the Riuer of the Amazons haue 10. miles or more of the like descent.

These

These are not taken as rules of necessity, as though water could not runne without that aduantage, for that respect the conueyers of waters in these times content themselves with one inch in 600. foot, as *Philander* and *Viturnius* obserued, but is rather vnder a rule of commodity for expedition and wholsomnesse of water so conueyed, lest resting too long in pipes it should contract some vnholsome condition, or die through the slacknesse of motion, or long closenesse, or banishment from the aire, gather some aptnesse and disposition to putrifie. Although I say, such exesse of aduantage as in the artificiaall conueyance of waters the forenamed Authors require, be not of necessity exacted in the naturall deriuation of them, yet certaine it is, that the descent of riuers being continually and their course long, and in many places swift, and in some places headlong and furious; the differences of height or aduantage cannot be great betwixt the springs of the riuers and their out lets, betwixt the first rising out of the earth and their falling into the Sea: vnto which declinury of land seeing the deepenesse of the Sea in proportion answer as I before declared, and not onely to the height of the hills: it is concluded, that the deepenesse to bee much more than the Philosophers commonly reputed: and although the deepnesse of the Sardinian Sea, which *Aristotle* saith, was the deepest of the Mediterranean, recorded by *Posidonius* in *Strabo*, to haue bene found but 1000. fadome, which is but a mile and a fifth part, and the greatest bredth not past 600. miles: then seeing if in so narrow a Sea it be so deepe, what may we esteeme the maine Ocean to be, that in many places is fve times so broad, seeing the broader the Seas are, if they be intire and free from Islands, they are answeribly obserued to be the deeper. If you desire any further satisfaction, reade the first part of *Purchas* his Pilgrimage, where you may reade how to find all those Authors at large. Now because he hath taken neere 100. times as much from me, I haue made bold to borrow this from him, seeing he hath sounded such deepe waters for this our Ship

The determination of these questions.

Note the difference betwixt the springs of the riuers, and their falling into the Seas: not great.

to failein, being a Gentleman whose person I loued, and whose memory and vertues I will euer honour.

CHAP. XI.

Proper Seatearmes belonging to the good or bad condition of Ships, how to finde them and amend them.



A wholesome ship.

An vnwholsome
Ship.
Howling a Ship.

Flaring

Ship that will try hull, and ride well at Anchor, we call a wholesome Ship. A long Ship that drawes much water will doe all this, but if she draw much water and be short, she may hull well, but neither try nor ride well; if she draw little water and be long, she may try and ride well, but neuer hull well, which is called an vnwholsome Ship. The howling in of a Ship is when shee is past the bredth of her bearing she is brought in narrow to her vpper workes: it is certaine this makes her wholesome in the Sea without rowling, because the weight of her Ordnance doth counterpoise her bredth vnder water, but it is not so good in a man of warre, because it taketh away a great deale of her roome, nor will her tacks euer so well come aboard as if she were laid out aloft and not flaring, which is when she is a little howling in, neere the water, and then the vpper worke doth hang ouer againe, and is laid out broder aloft, this makes a Ship more roomy aloft for men to vse their armes in, but Sir Walter Rawleighs proportion, which is to be proportionally wrought to her other worke is the best, because the counterpoise on each side doth make her swimme perpendicular or straight, and consequently steady, which is the best.

If a ship be narrow, and her bearing either not laid out enough

enough or too low, then you must make her broader and her bearing the higher by ripping off the planks two or three strakes vnder water and as much aboue, and put other Timbers vpon the first, and then put on the planks vpon those Timbers, this will make her beare a better saile, but it is a hindrance to her sailing, this is to be done when a Ship is cranke sided and will beare no saile, and is called Furring. Note also, that when a Ship hath a deepe Keele it doth keepe her from rowling. If she be stoty and her keele shallow, put on another keele vnder the first to make it deeper, for it will make her hold more in the water, this wee call a false Keele. Likewise if her stem be too flat to make her cut water the better, and not gripe, which is when shee will not keepe a winde well; fix another stem before it, and that is called a false stem, which will make her rid more way and beare a better saile. Also the Run of a ship is as much to be regarded, for if it be too short and too full below, the water comes but slowly to the Rudder because the force of it is broken by her bredth, and then to put a false stem post to lengthen her is the next remedy, but to lengthen her is better; for when a Ship comes off handsomly by degrees, and her Tuck doth not lye too low, which will hinder the water from comming swiftly to the Rudder, makes her she cannot steare well, and they are called as they are, a good runne or a bad. When a Ship hath lost a peece of her Keele, and that we cannot come well to mend it, you much patch a new peece vnto it, and bind it with a stirrop, which is an iron comes round about it and the Keele vp to the other side of the Ship, whereto it is strongly nailed with Spikes. Her Rake also may be a defect, which is so much of the Hull, as by a perpendicular line the end of the Keele is from the setting on of the stem, so much as is without that forward on, and in like manner the setting in of her stem Post. Your French men giues great Rakes forwards on, which makes her giue good way and keepe a good wind, but if she haue not a full bow she will pitch her head extremely in the Sea. If shee haue but a small Rake,

Cranke side.
Furring.

A false Keele.
Gripe.

A false stem.
The runne.

A good runne.
A bad runne.

A Stirrop.

Her Rake.

Loo me.

Heeld.

Ouerfet.
Ouerthrow.Walt.
Wall reared.

Iron sicke.

Trim.

she is so blisse that the Seas meets her so suddenly vpon the Bowes shee cannot cut the water much, but the longer a ship is, the fuller should be her Bow, but the meane is the best. The looming of a ship is her prospectiue, that is, as she doth shew great or little: Her water draught is so many foot as she goes in the water, but the Ships that drawes most water are commonly the most wholesome, but the least draught goes best but rolls most, and we say a Ship doth heeld on Starboord or Larboord, that is, to that side shee doth leane most.

To ouerset or ouerthrow a ship, is by bearing too much saile you bring her Keele vpwads, or on shore ouerthrow her by grounding her, so that she falls vpon one side; and we say a Ship is walt when shee is not stiffe, and hath not Ballast enough in her to keepe her stiffe. And wall reared when she is right built vp, after shee comes to her bearing it makes her ill shapen and vnseemely, but it giues her within much roome, and she is very wholesome, if her bearing be well laid out. The Mastiing of a Ship is much to be considered, and will much cause her to saile well or ill, as I haue related in the mastiing a Ship. Iron sicke, is when the Bolts, Spikes, or Nails are so eaten with rust they stand hollow in the planks, and so makes her leake, the which to preuent, they vse to put lead ouer all the bolt heads vnder water. Lastly, the trimming of a ship doth much amend or impaire her sailing, and so alter her condition. To finde her trim, that is, how she will saile best, is by trying her sailing with another Ship so many glasses, trimmed a head and so many a sterne, and so many vpon an euen Keele, also the easing of her Masts and Shrouds, for some ships will saile much better when they are slacke than when they are taught.

CHAP. XII.

Considerations for a Sea Captaine in the choise of his Ship, and in placing his Ordnance. In giuing Chase, Boording, and entering a man of warre like himselfe, or a defending Merchant man.



IN Land seruicewe call a man of warre a Souldier either on foot or horse, and at Sea a Ship, which if she be not as well built, conditioned, and provided, as neere fitting such an imploiment as may be, she may proue (either) as a horseman that knoweth not how to hold his raines, keepe his seat in his saddle and stirrups, carry his body, nor how to helpe his horse with leg and spur in a curuet, gallop, or stop; or as an excellent horseman that knoweth all this, mounted vpon a Iade that will doe nothing, which were he mounted according to his experience, hee would doe more with that one, than halfe a dozen of the other though as well provided as himselfe. But I confesse, euery horseman cannot mount himself alike, neither euery Seaman ship himselfe as he would, I meane not for outward ornament, which the better they are, the lesse to be disliked; for there cannot be a brauer sight than a ship in her brauery, but of a competent sufficiency as the businesse requireth. But were I to chuse a ship for my self, I would haue her saile well, yet strongly built, her decks flush and flat, and so roomy that men might passe with ease; her Bow and chase so Gally-like contriued, should beare as many Ordnances as with conueniency she could, for that alwaies commeth most to fight,
and

How to chuse a Ship fit to make a man of warre.

and so stiffe, she should beare a stiffe saile and beare out her lower rier in any reasonable weather, neither should her Gunroome be vnprovided: not manned like a Merchant-man, which if they be double manned, that is, to haue twife to many men as would saile her, they think it is too many in regard of the charge, yet to speake true, there is few Merchant Ships in the world doth any way exceed ours. And those men they entertaine in good voiajes haue such good pay, and such acquaintance one with another in shipping themselves, that thirty or forty of them would trouble a man of warre with three or foure times their number manned with prest men, being halfe of them scarce hale Boullings. Yea, and many times a Pirat who are commonly the best manned, but they fight only for wealth, not for honour nor reuenge, except they bee extremely constrained. But such a Ship as I haue spoken of well manned with rather too many than too few, with all sufficient Officers; Shot, Powder, Victuall, and all their appurtenances, in my opinion might well passe muster for a man of warre.

His reward that
first disceries a
Ship, or enters a
prize.

Now being at Sea, the tops are seldome without one or other to looke out for purchase, because hee that first disceries a saile, if she proue prize, is to haue a good sute of Apparell, or to much money as is set downe by order for his reward, as also he that doth first enter a Ship there is a certaine reward allowed him; when wee see a Ship alter her course, and vseth all the meanes she can to fetch you vp, you are the chase, and hee the chaser. In giuing chase or chasing, or to escape being chased, there is required an infinite iudgement and experience, for there is no rule for it; but the shortest way to fetch vp your chase is the best. If you bee too lee-ward, get all your Tacks aboard, and shape your course as he doth to meet him at the neereſt angle you can, then he must either alter his course and Tacke as you Tacke as neere the wind as he can lye to keepe his owne till night, and then strike a Hull that you may not descry him by his sailes, or doe his best to lose you in the darke; for looke how much he falls to lee-ward, hee falls so much in
your

How to giue
chase, and escape
the chaser.

your way. If he be right ahead of you, that is called a sterne chase, if you weather him, for euery man in chasing dorth seekes to get the weather, because you cannot boord him except you weather him, he will laske, or goe large, if you gather on him that way, hee will trie you before the wind, though if your ordnance cannot reach him, if he can out-strip you he is gone: But suppose you are to wind-ward, if hee clap close by a wind, and there goes a head sea, and yours a lee-ward ship, if you doe the like your ship will so beat against the Sea, she will make no way; therefore you must goe a little more large though you chase vnder his lee till you can run ahead.

Boord and Boord is when two ships lie together side by side, but hee that knoweth how to defend himselfe, and worke well, will so cun his ship, as force you to enter vpon his quarter, which is the highest part of the ship, and but the mizen shrouds to enter by; from whence he may do you much hurt with little danger, except you fire him, which a Pirat will neuer doe, neither sinke you if he can chuse, except you be able to force him to defend himselfe. But in a Sea fight wee call Boording, in Boording where wee can, the greatest aduantage for your Ordnance is to boord him thwart the hawke, because you may vse all the ordnance you haue on one side, and she onely them in her prow; but the best and safest boording for entring is on the bow, but you must be caretull to cleare the decks with burning granados, fire-pois, pouches of powder, to which giue fire by a Gunpodwer match, to preuent traines to the powder chest, which are long boards ioyned like a triangle with diuers broad ledges on eiher side, wherein lieth as many peeble stones or beatch as can there lie, those being fired will make all cleare before them. Besides in an extremity a man would rather blow vp the quarter decke, halfe decke, fore castle, or any thing, than bee taken by him he knowes a mortall enemy, and commonly there is more men lost in entering, if the chase stand to her defence, in an instant, than in a long sight boord and boord, if she be prouided of her

Boord & boord

Boording & entering a ship.

Powder chests.

close fights: I confesse, the charging vpon trenches, and the entrances of a breach in a rampire are attempts as desperate as a man would thinke could be performed, but he that hath tried himselfe as oft in the entering a resisting ship as I haue done both them & the other, he would surely confesse there is no such dangerous seruice ashore, as a resolute resolution fight at sea. A ships close fights, are smal ledges of wood laid crosse one another like the grates of iron in a prisons window, betwixt the maine mast, and the fore mast, & are called gratings, or nettings as is said, which are made of small ropes, much in like manner couered with a saile, the which to vndoe is to heaue a kedger, or fix a grasling into them, tied in a rope, but a chaine of iron is better, and shearing off will teare it in peeces if the rope and anchor hold, some haue vsed sheare hookes, which are hookes like sickels fixed in the ends of the yards armes, that if a ship vnder saile come to boord her, those sheares will cut her shrouds, and spoile her tackling, but they are so subiect to breake their owne yards, and cut all the ropes comes from the top-sailes, they are out of request. To conclude, if a ship bee open, presently to boord her is the best way to take her. But if you see your chase strip himselfe into fighting sailes, that is to put out his colours in the poope, his flag in the maine top, his streamers or pendants at the ends of his yards armes, furl his spret-saile, pike his mizen, and sling his maine yard, prouide your selfe to fight. Now because I would not bee tedious in describing a fight at Sea, I haue troubled you with this short preamble that you may the plainlier vnderstand it.

Evident signes
that a chase will
fight.

C H A P.

CHAP. XIII.

*How to manage a fight at Sea, with the proper
tearmes in a fight largely expresse, and
the ordering of a Nauy at Sea.*



Or this master peece of this worke, I confesse I might doe better to leaue it to euery particular mans conceit as it is, or those of longer practice or more experience, yet because I haue seene many bookes of the Art of Warre by land, and neuer any for the Sea, seeing all men so silent in this most difficult seruice, and there are so many young Captaines, and others that desire to be Captains, who know very little, or nothing at all to any purpose, for their better vnderstanding I haue proceeded thus farre, now for this that followes, what I haue seene, done, and conceiued by my small experience, I referre me to their friendly constructions, and well aduised considerations.

Many bookes of
the Art or War
for the land, none
for the sea.

A saile, how beares she or stands shee, to wind-ward or lee-ward, set him by the Compasse; he stands right ahead, or on the weather-Bow, or lee-Bow, let sic your colours if you haue a consort, else not. Out with all your sailes, a steady man to the helme, sit close to keepe her steady, giue him chase or fetch him vp; hee holds his owne, no, we gather on him. Captaine, out goes his flag and pendants, also his waste clothes and top armings, which is a long red cloth about three quarters of a yard broad, edged on each side with Calico or white linnen cloth, that goeth round about the ship on the out sides of all her vpper workes fore and aft, and before the cubbridge heads, also about the fore and

To giue chase.

Waste clothes.
Top armings.

Fighting sailes.
To hale a ship.

How to begin a
fight.

maine tops, as well for the countenance and grace of the ship, as to couer the men for being seene, heeturles and slings his maine yard, in goes his spret-taile. Thus they vse to strip themselues into their shote sailes, or fighting sailes, which is onely the fore saile, the maine and fore top sailes, because the rest should not be fired nor spoiled; besides they would be troublesome to handle, hinder our sights and the vsing our armes; he makes ready his close fights fore and aft.

Master how stands the chase? Right on head I say; Well we shall reach him by and by; What's all ready, Yea, yea, every man to his charge, dowe your top-saile to salute him for the Sea, hale him with a noise of trumpets; Whence is your ship? Of *Spaine*; Whence is yours? Of *England*; Are you a Merchant, or a man of War? We are of the Sea; He waues vs to lee-ward with his drawne sword, calls amaine for the King of *Spaine*, and springs his louse, giue him a chase peece with your broad side, and run a good berth ahead of him; Done, done, We haue the wind of him, and he tackes about, racke you about also and keepe your louse, be yare at the helme, edge in with him, giue him a volley of small shot, also your prow and broad side as before, and keepe your louse; Hee payes vs shot for shot; Well, wee shall requite him; What are you ready againe, Yea, yea. Try him once more as before, Done, done; Keepe your louse and loge your ordnance againe; Is all ready? Yea, yea; edge in in with him againe, begin with your bow peeces, proceed with your broad side, & let her fall off with the wind, to giue her also your full chase, your weather broad side, and bring her round that the sterne may also discharge, and your tackes close aboard againe; Done, done, the wind veeres, the Sea goes too high to boord her, and wee are shot thorow and thorow, and betweene wind and water. Try the pump, beare vp the helme, Master let vs breathe and refresh a little, and sling a man ouer boord to stop the leaks; that is, to trulle him vp about the middle in a peece of canuas, and a rope to keepe him from sinking, and his armes at liberty, with a mallet in the one hand, & a plug lapped in Okum, and well

How to sling a
man ouer boord.

well tarred in a tarpawling clout in the other, which he will quickly beat into the hole or holes the bullets made; What cheere mates, is all well? All well, all well, all well; Then make ready to beare vp with him againe, and with all your great and small shot charge him, and in the smoke boord him thwart the hawse, on the bow, mid ships, or rather then taile, on his quarter, or make fast your grapplings if you can to his close fights and sheare off. Captaine we are fowle on each other, and the ship is on fire, cut any thing to get cleare, and smother the fire with wet cloathes. In such a case they will presently be such friends, as to help one the other all they can to get cleare, lest they both should burne together and sinke; and if they be generous, the fire quenched, drinke kindly one to another; heaue their cans ouer boord, and then begin againe as before.

Well Master, the day is spent, the night drawes on, let vs consult. Chirurgion looke to the wounded, and winde vp the sinne, with each a weight or bullet at their heads and feet to make them sinke, and giue them three gunnes for their funerals, Swabber make cleane the ship, Purser record their Names, Watch be vigilant to keepe your berth to wind ward that we lese him not in the night, Gunners sponge your Ordnance, Souldiers scowre your peeces, Carpenters about your leakes, Boatswaine and the rest repaire the sailes and shrouds, and Cooke see you obserue your directions against the morning watch, Boy, Holla Master Holla, is the kettle boiled, yea, yea, Boatswaine call vp the men to prayer and breake fast.

A consultation & direct on in a sea fight, & how they bury their dead.

Boy fetch my cellar of bottels, a health to you all fore and aft, courage my hearts for a fresh charge, Gunners beat open the ports, and out with your lower fire, and bring me from the weather side to the lee, so many peeces as we haue ports to beare vpon him, Master lay him aboard louse for louse, mid ships men see the tops and yards well manned, with stones, fire pots, and brasse bailes, to throw amongst them before we enter, or if we be put off, charge them with all your great and small shot, in the smoke let vs enter

A preparation for a fresh charge

How a prise doth
yeeld, and how to
entertaine him
Sea-man like,

them in the shrouds, and euery Squadron at his best aduantage, so sound Drums and Trumpets, and Saint George for England.

They hang out a flag of truce, hale him a maine, a bafe, or take in his flag, strike their sailes and come aboard with their Captaine, Purser and Gunner, with their commission, cocket, or bills of loading. One goes the boat, they are lanced from the ship side, entertaine them with a generall cry, God saue the Captaine and all the company with the Trumpets sounding, examine them in particular, and then conclude your conditions, with feasting, freedome, or punishment, as you finde occasion; but alwayes haue as much care to their wounded as your owne, and if there be either young women or aged men, vse them nobly, which is euer the nature of a generous disposition. To conclude, if you surprize him, or enter perforce, you may Row the men, rife, pillage, or sacke, and cry a prise.

How to call a
Counsell of War,
and order a Nauy
at Sea,

To call a Councell of Warre in a Fleet; There is your Councell of Warre to manage all busineses of import, and the common Councell for matters of small moment, when they would haue a meeting, where the Admirall doth appoint it; if in the Admirall, they hang out a flag in the maine shrouds; if in the Vice Admirall, in the fore shrouds; if in the Reare Admirall, in the mizen; If there bee many squadrons, the Admirall of each Squadron vpon sundry occasions doth carry in their maine tops, flags of sundry colours, or else they are distinguished by seuerall pendants from the yards armes; euery night or morning they are to come vnder the Lee of the Admirall to salute him and know his pleasure, but no Admirall of any Squadron is to beare his flag in the maine top, in the presence of the Admirall generall, except the Admirall come aboard of him to Councell, to dinner, or collation, and so any ship else where he so resideth during that time, is to weare his flag in the maine top. They vse to martiall or order those Squadrons in rankes like Manaples, which is foure square, if the wind and Sea permits, a good berth or distance from
each

each other, that they becalme not one another, nor come not fowle of each other; the Generall commonly in the middest, his Vice Admirall in the front, and his Reare Admirall in the Reare; or otherwise like a halfe Moone, which is two squadrons like two triangles for the two hornes, and so the rest of the squadrons behinde each other a good distance, and the Generall in the middest of the halfe circle, from whence he seeth all his fleet, and sendeth his directions, as he findes occasion to whom he pleaseth.

Now betweene two Nauies they vse often, especially in a harbour or road where they are at anchor, to fill old Barks with pitch, tar, traine oile, lincet oile, brimstone, rosen, reeds, with dry wood, and such combustible things, sometimes they linke three or foure together in the night, and puts them adrift as they finde occasion. To passe a fort some will make both ship and sailes all black, but if the fort keepe but a fire on the other side, and all the peeces point blanke with the fire, if they discharge what is betwixt them and the fire, the shot will hit if the rule bee truly obserued; for when a ship is betwixt the fire and you, shee doth keepe you from seeing it till shee bee past it. To conclude, there is as many stratagems, aduantages, and inuentions to be vsed as you finde occasions, and therefore experience must be the best Tutor.

Stratagems for
Sea-men.

CHAP.

C H A P. XIV.

The names of all sorts of great Ordnance, and their appurtenances, with their proper tearmes and expositions, also diuers obseruations concerning their shooting, with a Table of proportion for their weight of metall, weight of powder, weight of shot, and there best at randome and point blanke enlarged.

The Names of
great Ordnance.



Canon royal or double Canon, a Canon, a Canon Serpentine, a bastard Canon, a demy Canon, a Canon Petio, a Culuering, a Basilisco, a demy culuering, a bastard Culuering, a Sacar, a Minion, a Falcon, a Falconet, a Serpentine, a Rabbinet. To all these doe belong carriages

Carriages.

Trunnions.

Cap'squares.

Wheels.

Trucks.

whereon peeces doe lie supported by an axeltree betwixt two wheeles, whereon doth lie the peece vpon her trunnions, which are two knobs cast with the peece on each of her sides, which doth lie in two halfe holes vpon the two cheekes of the carriages, to raise her vp or downe as you will, ouer them are the cap'squares, which are two broad peeces of iron doth couer them, made fast by a pin with a fore locke to keepe the peece from falling out. That the peece and carriages is drawne along vpon wheeles euery one doth know, if shee bee for land seruice, they haue wheeles made with spokes like coach wheeles, and according to their proportion strongly shod with iron, and the

the pins at the ends of the Axeltree is called Linch pins.

If for Sea she haue Trucks, which are round intier peecees of wood like wheeles. To mount a peece is to lay her vpon her carriages; to dismount her to take her downe. Her Bed is a planke doth lie next the peece, or the peece vpon it vpon the carriage, and betwixt the Peece and it they put their quoincs, which are great wedges of wood with a little handle at the end to put them forward or backward for leuellling the Peece as you please. To trauas a Peece is to turne her which way you will vpon her Platforme. To dispart a Peece is to finde a difference betwixt the thicke nisse of the metall at her mouth and britch or carnouse, which is the greatest circle about her britch, and her mussell Ring is the greatest circle about her mouth thereby to make a iust shot, there are diuers waies to dispart her, but the most easiest is as good as the best: and that is but by putting a little slicke or a straw that is strait into the touch hole to the lower part of the Sillinder or Concaue, which is the bore of the Peece and cut it off close by the metall, and then apply it in the same manner to the mouth, and it will exactly shew you the difference, which being set vpon the mussell of the Peece with a little Clay, Pitch, or Wax, it will bee as the pin of any Peece is to the sight, leuell to the carnouse or britch of the Peece, otherwaies you may giue her allowance according to your iudgement.

Taper boared, is when a Peece is wider at the mouth then towards the britch, which is dangerous (if the Bullet goes not home) to burst her. Honicombed, is when shee is ill cast or ouermuch worne shee will bee rugged within, which is dangerous for a crosse barre shot to catch hold by, or any ragge of her wadding being a fire and sticking there may fire the next charge you put in her; and you may finde if she be Taper boared, either with a crooked wyer at the end of a long staffe, by scratching vp and downe to see where you can catch any hold, or a light candle at the end of a staffe thrust vp and down to see if you can see any fault. Britchings are the ropes by which you lash your Ordnance fast

To mount a
Peece.
To dismount a
Peece.
Beds.
Quoincs.

Trauas.
Dispart.

Britch.
Carnouse.
Mussell.

Sillinder.
Concaue.
Bore.

How to dispart a
Peece.

Taper boared.

Hony-combe.

How to finde it.

Britchings.

Chambers.

fast to the Ships side in foule weather. Chambers is a charge made of brasle or iron which we vse to put in at the britch of a sling or Murderer, containing iust so much powder as will driue away the case of stones of shot, or any thing in her. In a great Peece we call that her Chamber so far as the powder doth reach when she is laded.

Cartrages.

A Cartrage is a bagge of Canuasse made vpon a frame or a round peece of wood somewhat lesse than the bore of the Peece, they make them also of paper, they haue also Cartrages or rather cases for Cartrages made of Latten to keepe the Cartrages in, which is to haue no more powder in them than iust the charge of your Peece, and they are closely couered in those cases of Latten, to keepe them dry, and from any mischances by fire, and are farre more ready and safer than your Ladles or Budgbarrells. A Budgbarrell is a little Barrell made of Latten, filled with powder to carry from place to place for feare of fire; in the couer it hath a long necke to fill the Ladles withall without opening. A Ladle is a long staffe with a peece of thin Copper at the end like halfe a Cartrage, in bredth and length so much as will hold no more powder than the due charge for the Peece it belongs to. A Spunge is such another staffe, with a peece of a Lambe skin at the end about it to thrust vp and downe the Peece, to take off the dust, moisture, or sparkes of fire if any remaine in her. And a Rammer is a bob of wood at the other end to ramme home the Powder and the Waddings. Waddings is Okum, old clouts, or straw, put after the powder and the Bullet. A Case is made of two peeces of hollow wood ioyned together like two halfe Cartrages fit to put into the bore of a Peece, & a case shot is any kinde of small Bullets, Naitles, old iron, or the like to put into the case to shoot out of the Ordnances or Murderers, these will doe much mischief when wee lie boord and boord: but for Spunges and Rammers they vse now a stiffe Rope a little more than the length of the Peece, which you may turne and wind within boord as you will, with much more ease and safety than the other.

Round

Round Shot is a round Bullet for any Peece: Crosbar-shot is also a round shot, but it hath a long spike of Iron cast with it as if it did goe thorow the middest of it, the ends whereof are commonly armed for feare of bursting the Peece, which is to binde a little Okum in a little Canuasse at the end of each Pike. Trundle shot is onely a bolt of iron sixteene or eighteene inches in length; at both ends sharpe pointed, and about a handfull from each end a round broad bowle of lead according to the bore of the Peece cast vpon it. Langrell shot runnes loose with a shackell, to be shortened when you put it into the Peece, and when it flies out it dorth spred it selfe, it hath at the end of either barre a halfe Bullet either of lead or iron. Chaine shot is two bullets with a chaine betwixt them, and some are contriued round as in a ball, yet will spred in flying their full length in bredth; all these are vsed when you are neere a ship to shoot downe Masts, Yards, Shrouds, teare the sailes, spoile the men, or any thing that is aboue the decks. Fire-workes are diuers, and of many compositions, as Arrows trimmed with wild fire to sticke in the sailes or ships side shot burning. Pikes of wild fire to strike burning into a ship side to fire her. There is also diuers sorts of Granados, some to breake and fly in abundance of peeces euery way, as will your brasse balls & earthen pots which when they are couered with quartered bullets stucke in pitch, and the pots filled with good powder, in a crowd of people will make an incredible slaughter; some will burne vnder water, and neuer extinguish till the stuffe bee consumed; some onely will burne and fume out a most stinking poison smoe; some, being but onely an Oile, being nointed on any thing made of dry wood, will take fire by the heat of the Sunne when the Sunne shines hot. There is also a Powder, which being laid in like manner vpon any thing subiect to burne, will take fire if either any raine or water light vpon it; but those inuentions are bad on shore, but much worse at Sea, and are naught because so dangerous, and not easie to bee quenched, and their practise worse, because they may doe

Round shot.
Crosse bar shot.
To Attire a shot.
Trundle shot.
Langrell shot.
Chaine shot.
Fire workes.
Arrows of wild fire.
Pikes of wild fire.
Granados of diuers sorts.
Brasse Balles.

as much mischief to a friend as to an enemy, therefore I will leave them as they are.

Powder.
Serpentine powder.
Grosse corned Powder.
Fine corned Powder.

There are also diuers sorts of Powder, the Serpentine is like dust and weake, and will not keepe at Sea but be moist. The common sort is great corned powder but grosse, and onely vsed in great Ordnance. Your fine corned Powder for hand Guns is in goodnesse as your Salt-Peter is oft refined, and from ten pence a pound to eightene pence a pound.

A Tonkin.
A Fid

A Tonkin is a round peece of wood put into the Peeces mouth and couered with Tallow, and a fid a little Okum made like a naile put in at the touch hole, and couered with a thin lead bound about it to keepe the Powder dry in the Peece. Shackels are a kinde of Rings but not round, made like them at the hatches corners (by which we take them vp and lay them downe) but bigger, fixed to the middest of the ports within boord, through which wee put a billet to keepe fast the port for flying open in foule weather, which may easily indanger, if not linke the Ship. To cloy or poison a Peece, is to driue a naile into her touch hole, then you cannot giue fire. And to vnclay her, is to put as much oile as you can about the naile to make it glib, and by a traine giue fire to her by her mouth, and so blow it out.

To cloy a Peece
or poison her.

To vnclay.

Compass Callipers.

Compass Callipers belongs to the Gunner, and is like two halfe Circles that hath a handle and ioint like a paire of Compasses, but they are blunt at the points to open as you please for to dispart a Peece. A Horne is his touch box, his Primer is a small long peece of iron, sharpe at the small end to pierce the Cartrage thorow the touch hole. His Lint stock is a handsome carued stick, more than halfe a yard long, with a Cocke at the one end to hold fast his Match, and a sharpe pike in the other to stick it fast vpon the Deck or platforme vpright. The Gunners quadrant is to leuell a Peece or mount her to any randon. A darke Lanthorne is as well to be vsed by any body as he. For Morters, or such chambers as are only vsed for triumphs, there is no vse for them in this seruice; but for Curriours, Hargabusacrocks, Muskets,

Horne.
Priming Iron.

Lint stocke.

Gunners quadrant.
Darke Lanthorn.
Morters.
The names of
small Peeces, and
their implements

Muskets, Bastard-muskets, Colivers, Crabuts, Carbins, long Pistols or short Pistols, there belongs to them Bandiliers, bullet Bags, Wormes, Scowrers, melting Ladles, Lead, Molds of all sorts to cast their shot. Quarter Bullets is but any bullet quartered in foure or eight parts, and all those are as vsfull a ship-boord as on shore. For the soule, trunk, bore, fortification, the diuersity of their metals, and diuers other curious Theormes or tearmes vsed about great Ordnance, there are so many vncertainties as well in her mounting, leuelling vpon her platforme, as also the accidents that may happen in the powder, the ground, the aire, and differences in proportion, I will not vndertake to prescribe any certaine artificiall rule. These proportions following are neere the matter, but for your better satisfaction reade Master *Digs* Pantrimetria, Master *Smith*, or Master *Burnes* art of Gunnery, or Master *Robert Nortons* Exposition vpon Master *Digs* Stratiaticos, any of those will shew the Theoricke at large. But to bee a good Gunner you must learne it by practise.

Bandilers.
Bullet bags.
Wormes.
Scowrers.
Melting Ladles.
Lead Molds.
Quartered shot.

K₃

A

A Table of proportion for the weight and shooting of great Ordnance.

The names of the great Peeces.	The height of the peeces.	The weight of the peeces.	The weight of the shot.	The weight of the powder.	The breadth of the Ladle.	The length of the Ladle.	The quantity of powder to make of blank shot in a min.	Shot in a min.
	Inches.	Pounds.	Pounds.	Pounds.	Inches.	Inches.	Pounds.	Pounds.
1 A Canon Rovall.	8	8000	66	30	13 $\frac{1}{2}$	24 $\frac{1}{2}$	80	16
2 A Canon.	8	6000	60	27	12	14	85	17
3 A Canon Sarpentine.	7	5500	53 $\frac{1}{2}$	25	10 $\frac{1}{2}$	23 $\frac{1}{2}$	96	20
4 A Bassard Canon.	7	4500	41 $\frac{1}{2}$	20	10	23 $\frac{1}{2}$	120	18
5 A demy Canon.	6	4000	30 $\frac{1}{2}$	18	9 $\frac{1}{2}$	23 $\frac{1}{2}$	133	17
6 A Canon Petro.	6	3000	24 $\frac{1}{2}$	14	9	22	171	16
7 A Culvering.	5 $\frac{1}{2}$	4500	17 $\frac{1}{2}$	12	8 $\frac{1}{2}$	22 $\frac{1}{2}$	200	20
8 A Basilisco.	5	4000	15 $\frac{1}{2}$	10	7 $\frac{1}{2}$	22	240	5
9 A demy Culvering.	4	3400	9 $\frac{1}{2}$	8	6 $\frac{1}{2}$	21	300	20
10 A bassard Culvering.	4	3000	7	6 $\frac{1}{2}$	6	20	388	18
11 A Sacre.	3 $\frac{1}{2}$	1400	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	18	490	17
12 A Minion.	3 $\frac{1}{2}$	1000	4	4	4 $\frac{1}{2}$	17	600	16
13 A Faulcon.	2 $\frac{1}{2}$	660	2 $\frac{1}{2}$	2 $\frac{1}{2}$	4 $\frac{1}{2}$	15	1087	15
14 A Faulcon.	2 $\frac{1}{2}$	800	3	3	4 $\frac{1}{2}$	15	800	15
15 A Faulconet.	2	500	1 $\frac{1}{2}$	1 $\frac{1}{2}$	3 $\frac{1}{2}$	11 $\frac{1}{2}$	1950	14
16 A Sarpentine.	1 $\frac{1}{2}$	400			2 $\frac{1}{2}$	10	7200	13
17 A Rabonet.	1	300			1 $\frac{1}{2}$	6	4800	12

These Peeces be most serviceable for battery being within 80. peeces to their mark, within the charge of their forces.

These Peeces be good and also serviceable to be mixt with the above Ordnance for battery to peeces being crosst with the rest, as also for Castles, Forts, and Walls to be planted, and for defence.

These Peeces are good and serviceable for the field, and most ready for a force.

Note that seldome in Ships they vse any Ordnance greater than Demy Canons, nor haue they any certainty either at point blanke or any random.

Note your Serpentine powder in old time was in meale, but now corned and made stronger, and called Canon corne powder.

But that for small Ordnance is called corne Powder fine, and ought to haue in strength a quarter more, because those small Peeces are better fortified than the greater.

Now if you haue but one sort of Powder for all, abate $\frac{1}{4}$ part, and cut off $\frac{1}{4}$ of the bredth and length of your Ladle.

But Cartrages are now found the best and most readiest.

Prouided alwaies, that all Shot must be a quarter lesse than the height of the Peece.

C H A P.

C H A P. XV.

*How they diuide their shares in a man of Warre,
what Bookes and Instruments are fit for a
Sea-man, with diuers aduertisements for
Sea men, and the use of the petty Tally.*

Shares.

THe ship hath one third part, the victuallar the other third, the other third part is for the Company, and this is subdiuided thus in shares.

The Captaine hath	10	In some but 9.
The Lieutenant	9	or as he agreeth with the Captaine.
The Master	8	In some but 7.
The Mates	7	5.
The Chirurgeon	6	3.
The Gunner	6	5.
The Boatswaine	6	5.
The Carpenter	6	5.
The Trumpeter	6	5.
The 4. quarter Mast.	5	apeece, or 4.
The Cooper	5	4.
The Chirurg. Mate	5	4.
The Gunners Mate	5	4.
The Carpent. Mate	5	4.
The Corporall	4	3.
The quarter Gunners	4	3.
The Trump. Mate	3	3.
The Steward	4	3.
The Cooke	4	3.
The Coxswaine	4	3.
The Swabber	4	3.

In English ships they seldome vse any Marshall, whose shares amongst the French is equall with the Boatevanes, all the rest of the Younkers, or fore-mast-men according to their deserts, some 3. some 2. and $\frac{1}{2}$. some 1. and $\frac{1}{2}$. and the boyes 1. which is a single share, or 1. and $\frac{1}{2}$. or as they doe deserve.

Now the Master, or his right hand Mate, the Gunner, Boatswaine, and foure quarter Masters doe make the shares, not the Capitaine, who hath onely this privilege, to take away halfe a share, or a whole share at most, to giue from one to another as he best pleaseth.

For to learne to obserue the Altitude, Latitude, Longitude, Amplitude, the variation of the Compass, the Suns Azimuth and Almicanter, to shift the Sunne and Moone, and know the tides, your Roomes, pricke your Card, say your Compass, and get some of these bookes, but practice is the best.

Master *Wrights* errors of Navigation.

Master *Tapps* Sea-mans Kalender.

The Art of Navigation.

The Sea Regiment.

The Sea-mans secret.

Waggoner.

Master *Gunters* workes.

The Sea-mans glasse for the Scale.

The New Attracter for variation.

Master *Wright* for vse of the Globe.

Master *Hewes* for the same.

Instruments fitting for a Sea-man.

Compasses so many paire and sorts as you will, an Astrolabe Quadrant, a Croisse staffe, a Backe staffe, an Astrolabe, a Nocturnall.

Aduertisement
for young Com-
manders, Cap-
taines, and other
Officers.

The Young Gentlemen that desires command at Sea, ought well to consider the condition of his ship, victuall, and company, for if there be more learners than sailers how slightly soeuer many esteeme sailers, all the worke to saue, ship, goods, and liues must lie vpon them, especially in fowle weather, then their labour, hazzard, wet, and cold, is so incredible I cannot expresse it. It is not then the number of them that here can say at home what I cannot doe I can quickly learne, and what a great matter is it to saile a ship, or goe to Sea; surely those for a good time will doe more trouble than good, I confesse it is most necessary such should goe, but not too many in one ship; for if the labour of threescore should lie vpon thirty, (as many times it doth) they are so ouer-charged with labour, bruises, and ouer-straining themselves they fall sick of one disease or other, for there is no dallying nor excuses with stormes, gusts, ouer-growne Seas, and lee-shores, and when their victuall is putrified it endangers all: Men of all other professions in lightning, thunder, stormes, and tempests with raine and snow may shelter themselves in dry houses by good fires, but those are the chiefe times Sea-men must stand to their tackling, and attend with all diligence their greatest labour vpon the deckes. Many suppose any thing is good enough to serue men at sea, and yet nothing sufficient for them ashore, either for their healthes, for their ease, or estates, or state; A Commander at Sea should doe well to thinke the contrary, and prouide for himselfe and company in like manner; also seriously to consider what will bee his charge to furnish himselfe at Sea with bedding, linnen, armes, and apparrell, how to keepe his table aboard, and his expences on shore, and prouide his petty Tally, which is a competent proportion according to your number of these particulars following.

the petty Tally.

Fine wheat flower cloie and well packed, Rice, Currants, Sugar, Prunes, Cynamon, Ginger, Pepper, Cloues, greene Ginger, Oyle, Butter, Holland cheefe, or
old

old Cheefe, Wine vineger, Canarie sacke, *Aqua vita*, the best Wines, the best waters, the iuyce of Limons for the scuruy, white Bisket, Oatmeale, gammons of Bacon, dried Neats tongues, Beefe packed vp in vineger, Legs of Mutton minced and stewed, and close packed vp, with tried sewer or butter in earthen pors. To entertaine strangers Marmalad, Suckers, Almonds, Comfits and such like.

Some it may bewill say I would haue men rather to feast than fight; But I say the want of those necessaries occasions the losse of more men than in any English fleet hath beene slain since 88. For when a man is ill, or at the point of death, I would know whether a dish of buttered Rice with a little Cynamon, Ginger, and Sugar, a little minced meat, or rost Beefe, a few stewed Prunes, a race of greene Ginger, a Flap-jacke, a can of fresh Water brewed with a little Cinamon, Ginger, and Sugar bee not better than a little poore Iohn, or salt fish with oile and mustard, or bisket, butter, cheefe, or oatmeale portage on fish dayes, or on flesh dayes salt Beefe, Porke, and Pease with six shillings beere, this is your ordinary ships allowance, and good for them are well it well conditioned, which is not alwayes as Sea-men can (too well) witnesse. And after a storme, when poore men are all wet, and some haue not so much as a cloth to shife him, shaking with cold, few of those but wil tell you a little Sacke or *Aqua vite* is much better to keepe them in health, than a little small beere, or cold water although it be sweet. Now that euery one should provide those things for himselfe, few of them haue either that providence or means, and there is neither Ale-house, Tauerne, nor Inne to burne a faggot in, neither Grocer, Poulerer, Apothecary, nor Butchers shop, and therefore the vse of this petty Tally is necessary, and thus to be imploied as there is occasion. To entertaine strangers as they are in quality euery Commander should shew himselfe as like himselfe as he can, as well for the credit of the ship, and his setters forth,

The vse of the
petty Tally.

A Sea Grammar.

as himselfe; but in that herein every one may moderate
 themselves according to their owne pleasures, therefore I
 leaue it to their owne discretions, and this brieve
 discourse, and my selfe to their friendly
 construction, and good opinion.

Finis

Ff Nf S.
